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"CLEAN UP WEEK" IN ST. LOUIS

Method of Organizing and Controlling Extra Teams Used for This Purpose—Cost in Detail of Removing Fourteen Hundred Loads of Rubbish—Instructing Citizens in Their Part.

By HARRY M. CRUTCHER.

A general "clean-up" of a large city in a week's time is no small undertaking, but by scientific management and the co-operation of the citizens of St. Louis, the street department of that city successfully waged its second annual renovating campaign during the week of May 3d, removing 1,415 wagon loads of rubbish at a cost of \$1.64 per load.

The "clean-up" was carefully planned several days before the actual removal of rubbish began. The newspapers, by their co-operation, aided the department greatly, publishing the details of the campaign, giving the boundaries of the various districts, and telling the householder how to pile the rubbish in the alley or street so that it would be acceptable.

Practically all of the teams used during the week were hired. The wagons were classified according to size. The teams with large coal wagons, hay frames or barrel wagons were hired at the rate of \$5 per day. Those with smaller wagons were allowed \$4 a day.

and the location of the dumps. The superintendents were given special instruction showing just which beats they were to cover and containing a list of the inspectors under them.

Close account was kept of the teams, each inspector at the dumps being given instructions to note the time of their arrival at and departure from the dumps. In the same way the inspectors on the beats kept a record showing the time of the teams' departure for the dump and the hour of their return. Jules Laxton, who had charge of the work, regards this checking of the teams as very essential, inasmuch as it enabled him to determine whether or not teamsters loitered on the way to or from the dumps. A loss of only ten minutes a day on 60 teams would amount to 10 hours or \$5 in money, he points out.

Four superintendents, 29 inspectors, and an average of 62 teams per day, made up the organization for the week.



CITY ASH WAGON USED IN CLEAN-UP.



RUBBISH AT CURB, READY FOR REMOVAL.

The organization of the clean-up forces began on Saturday, May 2, when the superintendents and inspectors were called together at the City Hall to receive their instructions. These men were furnished with schedules in the form of maps of the city with the clean-up district for each day of the week indicated thereon. One district was cleaned on Monday, another on Tuesday, and so on. Each district was subdivided into beats and the names of the inspectors assigned to these beats were written on the maps. Each man was also furnished with a typewritten statement giving the boundaries of the various beats, showing the number of teams assigned these beats, the starting place for the teams,

On Monday morning several of the teams failed to put in their appearance; in other cases the teamsters, upon learning of the nature of the clean-up work, departed, refusing to serve. Mr. Laxton was prepared for this emergency, having arranged with the superintendent of the city stables to hold a number of city teams as a reserve in case they should be needed.

The organization was working much more smoothly on Tuesday morning. A record was kept of several small districts in the Monday and Tuesday district which were not touched on these two days, and the surplus of the reserve teams was used to clean up these places.

On Wednesday some of the beats were cleaned as

early as 11 a. m. The teams in these beats were then transferred to the other beats where the collection was heavier.

A meeting of the superintendents was held each day at noon. At these meetings the men discussed the work and exchanged suggestions while they lunched.

Mr. Laxton reports that considerable trouble was experienced by the workers as a result of the overhauling of rubbish piles by junk men who proceeded through the beats in advance of the clean-up forces and in their search for bottles, metal, etc., scattered many of the piles of rubbish in such a manner that the teams were forced to leave them behind.

The complaints received at the street department offices were comparatively few. On Monday one complaint was received; Tuesday brought 12; Wednesday, 12; Thursday, 20; Friday, 19, and Saturday, 23, a total of 87. Mr. Laxton reports that the majority of these complaints were confined to districts which the teams were unable to reach on the day scheduled.

The street department officials plan to change some of the details of the system when the next clean-up period is at hand. This year, the teams were started in the center of one side of a beat, with instructions to work in opposite directions. In certain beats or districts where the removal of rubbish was not completed on the day designated, the uncleaned portions were far apart. Hereafter, the teams will be started at opposite corners of one side of the beat, and will work towards each other. In this way, any rubbish which may not be removed on the day designated will be concentrated.

The cost of the clean-up was as follows:

An equivalent of 373¼ teams for one day.....	\$1,493.00
Twenty-nine inspectors, 6-30 of a month at \$75 per month.....	435.00
Two inspectors, 3-30 of a month, at \$75 per month.....	15.00
One inspector, one day at \$2 per day.....	2.00
One general superintendent, 3-30 of a month, at \$1.75 per day.....	85.75
One superintendent, 6-30 of a month, at \$208.33 per month.....	41.66
One general superintendent, 3-30 of a month, at \$150 per month.....	15.00
One superintendent, 6-30 of a month, at \$100 per month.....	20.00
One superintendent, 6-30 of a month, at \$75 per month.....	15.00
One superintendent, 6-30 of a month, at \$50 per month.....	10.00
Car fare.....	13.00
Printing 70,000 circulars.....	45.50
Dumping privilege on 475 loads at \$0.25.....	118.75
Dumping privilege on 232 loads at \$0.05.....	11.60
	\$2,321.26

A comparison of cost last year and this year follows:

	June, 1913	May, 1914
Equivalent teams one day.....	360	373¼
Equivalent inspectors one day.....	79	181
Printing.....	\$140.00	\$45.50
Dumping privilege.....	\$237.90	\$130.35
Number loads hauled.....	1,333	1,415
Cost per load.....	\$2.02	\$1.64
Total cost.....	\$2,693.40	\$2,321.26
Average number loads per team per day.....	3	3¾

The above shows a reduction of \$0.38 in the cost per load, or \$537.70 on 1,415 loads.

During the week following "Clean-up Week," fourteen teams were engaged removing rubbish from spots which were not covered as per schedule. Six of these teams were hired and the others were city teams, all using city ash wagons. The total number of loads hauled by these teams was 157, at an expense of \$282 or \$1.79 per load. Inasmuch as no record of this part of the clean-up was kept last year, the comparison covering this feature of the clean-up is not given.

Mr. Laxton, in a report to the street commissioner, makes the following suggestions for future clean-up work:

"It is my opinion that the cost can be further reduced in future operations by putting in effect a graduated scale or price per load. We could get along with fewer inspectors and their duty would consist only in seeing that wagons were fully loaded and teamsters were kept within the confines of their own beats. We would have no trouble in getting teams, as this proposition would interest the man who has only one team and drives it himself. He would be anxious to make as much as possible and we would not have to call on contractors for a number of teams.

"The hired drivers do not have any ambition to do any more than is absolutely necessary and are very hard to handle. The scale in mind is about as follows:

35 Cu. Ft. Bed.....	\$0.75 per load
50 Cu. Ft. Bed.....	.90 per load
Coal wagons, etc.....	1.00 per load

"By following the above idea the average number of loads per day per team would be 4½ or 5."

A few days previous to the clean-up, the street department placed in the hands of the police department about 70,000 circulars explaining the proposition of cleaning up the city. The policemen distributed these throughout the municipality. These circulars, in addition to giving the boundaries of the various districts and designating the day on which they were to be cleaned, bore the following instructions:

- Don't pile rubbish in the alleys or streets.
- Have all your rubbish in receptacles so it can be loaded quickly.
- Don't expect this department to enter your premises to shovel rubbish. We carry no shovels.
- Don't wait until the day of collection to clean up; Do it Now.
- Don't expect our wagons to wait for your rubbish; have it ready.
- Don't place ashes for the department to take. Receptacles containing all or part ashes will be refused.
- Don't load receptacles too heavy for two men to handle.

The circulars also informed the citizens that rubbish from vacant lots would be removed if placed in receptacles.

PURCHASING COAL BY HEAT UNITS.

A controversy over specifications for coal for the city of Yonkers, N. Y., in which city officials and coal dealers were at odds with one another for more than a year, has been settled in the adoption by the Board of Contract and Supply of a new set of specifications, increasing the ash percentage of pea coal. The old specifications called for pea coal having not more than twelve per cent of ash after combustion. The new ones increase the limit to eighteen per cent, and provide for a bonus where coal is found to have less than that limit.

At the beginning of the dispute, coal dealers said that producers could not furnish pea coal as called for in the city specifications. Nevertheless, the city advertised for bids under the specifications having the twelve per cent clause, and the firm of Hays and Randolph of Yonkers, the only bidder, was awarded the contract.

Tests of the coal they supplied the city under the contract were made by the city chemist and by another coal dealer, and showed the coal to have varying degrees of ash, ranging below and above, mostly above, the limit of twelve, and averaging about 15 per cent. Upon these findings another Yonkers coal dealer took the case to the courts and endeavored to obtain an injunction restraining the city from buying coal under

the specifications containing a twelve per cent ash clause, but was defeated by the city.

The city's specifications are as follows:

Coal shall be furnished and delivered into the coal bunkers at the low service, the filter plant, the high service stations, or as directed by the commissioner of public works.

Deliveries shall be commenced as soon as the contract is executed, and shall continue at the rate of not less than 700 tons per month, and shall be divided between the various stations.

Coal shall be weighed on the public scales of the city of Yonkers and a gross ton of coal shall be 2,240 pounds. Coal to be furnished shall be of the best quality Scranton or Pittston pea coal. The standard percentage of ash after combustion shall be 18 per cent. Coal shall be analyzed by the chemist of the water bureau, or by an assistant designated by the commissioner of public works.

A penalty of 5 cents a ton for each 1 per cent of ash shall be exacted on all coal that is delivered in excess of the ash percentage, and a bonus of 5 cents a ton for each 1 per cent shall be given on all coal that is delivered under the standard percentage of ash.

The contractor shall furnish to the commissioner of public works copies of the original bills of lading on all boat loads of coal, giving the weight of coal consigned, the date or dates of shipment and the name of the mine or mines from which the shipments of coal were made.

Two firms have bid twice under these conditions, and one of them received two contracts, one for 6,000 tons of pea coal for the water bureau and the other for 250 tons of the same coal for the crematory. The bids for the former were \$27,300 and \$26,250; for the second contract, \$1,137.50 and \$1,093.75.

MUNICIPAL COLLECTION OF ASHES.

Data from Fifteen Large Cities—Amount per Capita, Cost per Capita and per Cubic Yard—Advantages of Municipal Collection.

A short time ago a movement was started in Providence, R. I., to have the city collect ashes and rubbish, and as an aid to it C. D. Morse, a student in Brown University, collected information on the practice of thirty-two of the largest cities. Abstracts of his summary of the facts ascertained are given herewith.

Of the cities, seven (Denver, Hartford, Kansas City, New Haven, Portland, Ore., St. Paul and Worcester) required the householder to dispose of his ashes and rubbish (Hartford has since assumed this service). Certain figures were compiled by the author, as follows:

CITY	Cubic yards collected per capita.	Cost per capita.	Cost per cubic yard.	Cubic yards collected per man employed.	Population served per man employed.
Cambridge	1.50	\$.50	\$.33	2492	1657
Detroit	1.44	.72	.50	1822	1258
Boston	1.44	.83	.58	1933	1342
Buffalo	1.42	.33	.23	2884	2026
Syracuse	1.30	.27	.21	5870	4487
Washington ....	.93	.26	.25	2899	3116
Lowell .....	.90	.14*	.15	4092	4531
Cincinnati .....	.77	.35	.45	2079	2691
Milwaukee .....	.73	.57	.77	734	1000
Cleveland .....	.64	.33	.51	2205	3411
Fall River .....	.62	.33	.53	1881	3988
Chicago .....	.61	.36	.59	2410	3949
Rochester .....	.41	.85	2.09	407	1001
Minneapolis ....	.15	.18	1.22	714	4621
Average .....	.92	.45	.60	2316	2791

* Expense of labor only included.

Many of the cities could not furnish figures as to both amount collected and cost of collection.

It was found that in Providence the cost for private removal of ashes is \$1.25 for a 2-cubic yard load, ten cents for a household can. One office building pays \$150 a year, another \$812. The common method among householders is to store ashes and rubbish in the cellar or back yard and have it removed two or three times a year—this storing being often unsanitary and unsightly.

In some cities where the municipality performs the service the array of ash cans and rubbish along the street on the days when collections are made is unsightly. While this objection holds good in many cities it is not characteristic of municipal collection. There are several ways of avoiding this trouble. In Milwaukee, New York city and other places the collections are made at night. In Syracuse the city ordinances require that empty cans shall not remain on the sidewalk for more than one hour after being emptied. In Springfield, Mass., the city collectors even go into basements and return cans there when emptied. In Montclair, N. J., this is also done, if the householder desires, for the payment of a small additional fee.

"In Providence the habit among householders has been to keep ashes and rubbish cans in the basement. In the cities having municipal collection, cans are kept on the ground level in the rear yard.

"In carrying away the waste from the premises the best plan wherever possible is to collect on rear alleys. Where not possible the street in front of the residence or store must be used. It would seem that the night plan of collection, found very satisfactory in many cities, could be applied to Providence. In the residential districts the cans could be placed on the curb the night before, collected early in the morning and the empty receptacles returned to the back yard.

"The residential and down-town business districts could thus be accommodated early in the day so that except for a few hours in the morning one day a week the street could be kept entirely free from cans and rubbish. The wharves, storehouses and factory districts could be attended to later."

PITTSBURG'S BLOWN UP SEWER REPAIRED.

As stated in our news items last November, 3,900 lineal feet of 8-foot and 10-foot brick sewer in Pittsburg, Pa., was destroyed by an explosion during that month, causing probably more damage than a similar explosion had ever cost in any city. Considerable expense was incurred by emergency work night and day in making temporary provision for the water carried by the sewer, following which the permanent reconstruction of the sewer was begun. This construction is now just about completed, and the total cost of repairing the destructive work of the explosion has somewhat exceeded \$200,000.

At the time the explosion was attributed to gas of some kind, but both the nature and source of the gas were unknown. An investigation of the explosion was made by engineers, but no cause for it has ever been ascertained.

OXYGEN HELMETS IN PITTSBURG.

It has recently been announced by the director of the Department of Public Safety of Pittsburg, C. S. Hubbard, that every fire station in that city will be equipped with oxygen helmets to be used by firemen in rescue work. The plan is to equip each engine house with at least two oxygen outfits, and an order has already been placed for a number of these. This decision of the director followed a very successful test of this device.

FIRE HYDRANT RENTAL*

Better Methods for Apportioning Fire Protection Cost —Payment of Actual Cost on Basis of Capacity of Distribution System.

By JOHN W. ALVORD.

Probably no one thing has contributed so much to the friction between private water companies and municipalities as the common and antiquated method of paying for fire protection at a fixed sum per hydrant. It is the purpose of this paper to point out some of the evils resulting from unscientific apportionment of fire protection costs, and show how they can be remedied.

In the formation of so many new utility commissions as are now created, and are being created, there arises the opportunity to obtain a more equitable and scientific adjustment of rates than has hitherto prevailed. The Wisconsin commission has already done valuable work in showing that many of the municipalities in Wisconsin do not pay enough for public fire protection—that is to say, that the cost of the public fire protection system is in considerable part loaded onto the private consumer. It is a matter of common knowledge among those who study this subject that this is largely true all over the country. This condition doubtless arose from the fact that when franchises were originally granted it was easier for city councils to grant, and water company promoters to obtain, concessions for a slightly larger domestic rate, which came from many small consumers, than a proper and just public payment coming from a usually insufficient and ordinarily depleted general fund.

The injustice of this proceeding is fully evident when a careful study of the two services is made. The valuable paper on this subject by Messrs. Kuichling, Hawley and Metcalf, presented to the American Water Works Association at the Rochester meeting, shows generally that with the smaller cities fire protection cost rises to a 65 or 75 per cent proportion of all the service, while in the larger cities this may be as low as 20 and 25 per cent.

The Wisconsin commission has, as the result of its studies, generally raised the fire protection cost, and correspondingly lowered the domestic rate in the following cases:

Date of report.	City.	Population 1910.	Per cent of water works charged to fire service.	Annual charge for fire service.
1910	Jefferson, Wis..	2,582	75.0	\$2,560
1910	Ripon, Wis.....	3,739	65.0	6,082
1911	Oconto, Wis....	5,629	57.5	9,812
1909	Ashland, Wis....	11,594	54.5	20,480
1911	Janesville, Wis..	13,894	54.0	15,795
1911	Beloit, Wis.....	15,125	48.0	14,863
1910	Madison, Wis....	25,531	49.6	About 17,000*

*Special local conditions favor a low fire service charge at Madison.

It is safe to say that in most instances where private utilities are serving the community, the city is paying less than half of the amount which properly should be paid for this service, thus loading the balance of the cost usually on to the small private consumer.

In the case of a municipality which owns its own plant, and has largely paid for it from issues of bonds, paid from annual taxes, the fixed charges are perhaps more equitably distributed, but it is yet an open question, even in such cases, if a careful study would not disclose that the consumer is not paying more than his proportion for the public service, by reason of the fact that he virtually bears all the operating cost.

The proper method of dividing the cost of public and private services is (1) to make a valuation of the plant;

*Paper before American Water Works Association.

(2) to make a study of the value of a theoretical plant, sufficient in capacity for fire service only, and (3) a study of the value of a theoretical plant, capable of domestic service only. The sum of the (2) and (3) study will give a value much greater than the value of the combined plant, and the value of the combined plant should then be divided between fire service and domestic service in proportion to the theoretical values found necessary in each case. To illustrate: if the cost of a combined fire and domestic service in a single plant is found to be \$100,000 for a given community, and the cost of a strictly fire service plant is found to be \$80,000, and a strictly domestic supply plant \$70,000, or a total for two separate plants of \$150,000 for the same community, then the value of the combined plant should be divided between the two services on the basis of eight-fifteenths and seven-fifteenths of the total value of the combined plant, or about \$53,400 for the proportionate investment for fire service, and about \$46,600 for the proportionate investment in domestic service.

In addition to this study, it is necessary to inquire, in the same manner, into the operating expenses, and divide the combined operating expenses between those chargeable to fire service and domestic service. Here it will be usually found that domestic service carries the higher charge.

Having found the total investment in each service, and computed its interest and depreciation, and added to this the proper proportion of operating expense, we have a proper and equitable division of annual revenue which should be derived as between the private consumer, on the one hand, and the public fire protection expense, on the other, and, as has been before said, it will be usually found that the public is not paying nearly enough for the public service, and the private consumer is bearing the burden.

Here, therefore, is an opportunity for our public service commissions to do some scientific rate-making, easing the burden particularly on the small consumer and placing it where it justly and properly belongs—on the general public.

But more than this can be done. When the proper amount for the public to pay for general fire protection is properly ascertained, it can be more scientifically applied than under the present irrational method, so that it will not result in the constant friction that the present method involves.

The method of paying for fire protection at so much per hydrant is very common, but it is illogical and improper, for the following reasons:

1. It does not apply the payments to what the public really pays for, viz., pumping capacity, distribution capacity, and the size and number of fixture openings.

2. The present method has a tendency to contract the fire-fighting efficiency, by concentrating the payment on an outlet fixture, thus constantly tempting the cities to improper economy by the neglect to install the proper number and closer spacing of the hydrants, with increasing fire risk in any given district.

3. The present method spreads the cost of fire protection inequitably, in that cities have to pay for outlying districts, with low fire protection risks, as much per hydrant as in central business property, with high protection risks.

4. It discourages the extension of the distribution system into outlying districts, by reason of the relatively high cost of the hydrants needed.

5. It does not encourage the use of adequate sized mains, because attention is concentrated on the outlet fixture and its spacing, rather than the size and capacity of the distribution system.

6. It discourages the setting of additional and intermediate hydrants when the adjacent fire risks increase, even though capacity of mains may be available.

7. It makes for constant contention between the city and the company whenever new hydrants or new extensions are needed, by reason of the above facts, which neither the company nor the city officials are always able to fully analyze or understand. Thus we have these two important interests in constant antagonism, where both should be in harmony in working for a common end at a just cost.

Many of the bitterest contests between private companies and municipalities arise from this cause.

Now, all this source of contention and friction can be entirely avoided by a more proper method of payment for the public service, which will eliminate the objections above made, and place the burden of cost where it belongs; that is to say, in the capacity of the system for fire protection, rather than on the number and spacing of outlet fixtures. Just as it is more equitable to sell water to the private consumer per unit of volume, by meter, rather than by number of outlets in the consumer's home, so is it more equitable to pay for fire protection per unit of capacity for fire protection purposes, rather than mainly by unit of outlet fixture. In other words, let us pay the company for the amount of capacity it has in its pumping and distribution system, as well as for the number of outlets, and we will have destroyed most of the sources of friction that now exist.

The method that first suggested itself to the writer was to apportion fire protection cost in part to pumping capacity, in part to pipe distribution capacity, and in part to outlet, but on reflection it was seen that this triple division produced some complexity, which was not really needed, and which did not make for simplicity.

It is comparatively easy for cities to enforce the installation of adequate pumping capacity, and where pumping capacity does not amply exist it is not difficult for water companies to enlarge it in fairly reasonable length of time. Attention is constantly directed to deficient pumping capacity, and its future lack is not difficult to foresee.

But the enlargement of distribution pipe capacity up to the level of a constantly growing population is not so easily accomplished. Its lack is produced by insidious neglect, of which the manager, the administration and the public has no warning note. It is here, if anywhere, that we need in the ordinary plant and city to have an incentive to upkeep and enlargement. It would, therefore, appear that for purposes of simplicity it would be fully as effective to proportion fire protection payments in large part on pipe distribution capacity, and in small part on outlet fixture payments, as to proceed in a more complex manner by including pumping capacity.

With this principle in view, and having arrived at the proper amount to be paid the utility for fire protection by the methods herein first described, it remains to apportion this amount in such a way that incentive is introduced to properly install mains and distribution system of the proper size, and hydrants of the proper spacing, so that the fire risks will be proportionately met in different sections of the town, and at the same time, so that extensions and additional hydrant rental will not be burdensome, and, in short, that all or most of the causes of friction between the municipality and the utility enumerated above will be removed.

This can be done by paying for the fire service in large part per mile of pipe at rates depending on its capacity.

For the purpose of having some regulating limit, it is also desirable to pay for the hydrants a small sum, which represents a reasonable return on their cost of installation, together with an allowance for their depreciation and annual maintenance. This in reality amounts to a nominal sum, generally not more than \$5 to \$8 per annum per hydrant. At this rate it should be the privilege of the city to order in as many or as few hydrants as proper attention to the relative fire risks of the different sections of the city would seem to demand. A proper appreciation of the rapidity with which long lines of fire hose reduces pressure would undoubtedly make for a liberal allowance of hydrants under such a scale of payment.

The company, being paid an annual sum for the hydrants and their maintenance, has no separation of interest from the viewpoint of the municipality.

The bulk of the payment for fire protection under such a system should come from the pipe capacity unit.

The pipe capacity unit does not need to be scientifically exact; it is sufficient for all practical purposes if it is only approximate, and particularly desirable that it be simple.

The best unit which has occurred to the writer, that approximates in some degree the relative cost and capacity of mains sufficiently for this purpose, and is at the same time simple, is the inch foot of diameter—that is, the number of inches of diameter 1 foot long in a given system of distribution pipe. Thus, a 6-inch pipe is rated at 6 inch feet to every foot, and a 12-inch pipe 12 inch feet to every foot.

Having found the total amount of money to be paid for fire service in a given system, we should deduct the amount that will be raised by the nominal hydrant rental before described, and we should also deduct the amount which will be raised from sprinkler systems and other especial methods of fire protection, and the remainder will be the amount to be paid by the city on the pipe capacity unit or inch foot basis. The total number of inch feet in a given system, divided into the amount to be raised by this part of the protection will give us the cost per inch foot. This will probably fall in most normal cases within 4/10 to 7/10 of 1 cent per inch foot.

The total annual payment, then, for any given pipe will be its diameter times the inch foot unit times its length.

Thus, if the inch foot unit is a half a cent, a 6-inch pipe will have a fire protection rental of 3 cents per foot per annum, and a 12-inch pipe will have a rental value similarly of 6 cents a foot annually.

To this amount computed for all the pipe lines should be added the nominal hydrant rental computed on the total number of hydrants, the total making the annual public fire protection bill to the city.

It is true that the cost and capacity of mains increase at a rate greater than the first power of the diameter. The capacity increases as the square of the diameter, and the cost between the first power and the square. If the cost of mains is increased by the replacement cost of cutting through pavements, the adjustment of cost as between different diameters will be closer.

A uniform rate per inch of diameter is a slight inducement toward the smaller pipe, as that has the larger return, and this may be equalized (if it is thought wise) by a sliding scale, but, as a matter of practical effect, it is not believed that the variation will have any appreciable influence in keeping down the capacity of the distribution system.

The advantageous features of this arrangement are:

1. That the city proportions its payment to the amount

of distribution pipe capacity it receives, as well as the number of fixture openings (hydrants) that are available.

2. The payments for fire protection are usually and normally in proportion to the fire risks in the different districts, because the larger mains are in a general way either within, or lead to, those districts most fully built up and most needing fire protection.

3. There is every incentive to the company in extending its distribution system, to keep sizes of mains up to the fire requirements, and to reinforce weak districts, and the cities' interest in fire protection and the companies' interest in proper remuneration are thus co-ordinate.

4. In outlying districts the city does not have to pay for protection out of all proportion to the capacity needed, and it may further regulate the number of hydrants in such districts to suit their character and growth.

5. There is no obstacle to the introduction of new hydrants when given districts need increased fire protection, and thus the fire department is rendered much more efficient.

The writer, in company with Dean F. E. Turneure of Madison, Wis., and Dean Marston of Ames, Iowa, was appointed in 1912 as a board of arbitration to determine the value of the water works property at Freeport, Ill., decide upon the necessary enlargement of the plant, fix a schedule of fair rates, and draw up an ordinance for the extension of the franchise, should the city determine to extend rather than purchase.

This opportunity was taken to introduce the method of paying for fire protection described herein, and the city electing to extend the franchise, the method of paying for fire protection has now been in force there for the last two years, and has given satisfaction.

The value of the Freeport plant in April, 1912, was found to be \$316,000 (population about 19,000). New extensions and enlargements were recommended which would increase this amount to \$502,927. A fair return on this amount was recommended to be such that it would at no time fall below 7 per cent., after due allowance for all expense of operation and depreciation. This called for a return within four years of at least \$70,000.

From a careful analysis it was found in this particular case that 44 per cent of the total investment was necessary for fire protection, and 56 per cent for domestic consumption, and it was recommended that the city raise its payment for fire protection from a total of \$10,000 (the amount then paid) to \$15,000 in 1915, and \$19,800 later. A corresponding reduction was made in the rates to small consumers.

The apportionment of the fire protection cost was made on the basis herein described, and resulted as follows:

For each hydrant the annual sum of \$7.50 to cover interest, maintenance and depreciation.

For future extension as follows:

- \$0.10 annually per foot of 20-inch pipe.
- .08 annually per foot of 16-inch pipe.
- .06 annually per foot of 12-inch pipe.
- .05 annually per foot of 10-inch pipe.
- .04 annually per foot of 8-inch pipe.
- .03 annually per foot of 6-inch pipe.
- .02 annually per foot of 4-inch pipe.

No pipe smaller than 4-inch was recommended, and 4-inch not to be used for greater lengths than 1,000 feet between cross mains.

For private fire protection services:

Private hydrants, \$7.50 annually per hydrant.

\$0.06 annually per foot of 6-inch supply pipe.

.04 annually per foot of 4-inch supply pipe.

The charges per foot of private fire protection supply pipe being higher than charged the city, because such supply pipe affords no revenue from domestic consumers.

For sprinkler service:

An initial payment of the entire cost of the supply pipe, safety valves, etc.

For each sprinkler head, \$0.05 annually.

Minimum charge, \$50 per annum.

The above findings are only given to illustrate the working out of the system. Each case requires to be investigated by itself, and may result in very different figures, owing to special local causes.

It is to be hoped that the suggestions here contained will commend themselves to those cities or companies about to renew fire protection contracts, so that past causes for fruitless difficulties and friction may be avoided, and especially is it possible for the new public utility commissions to introduce such a method as is here outlined, because they have it easily within their power to adjust rates to a just and scientific basis, equitable to both the public and the private consumer, without bargaining or pressure from political or personal interest.

DISCUSSION ON WATER WORKS TOPICS

Superintendents Compare Notes at the Convention of the American Water Works Association—Cost, Operation and Maintenance of Meters—House and Fire Services.

Twenty-two questions were discussed at the Am. W. W. Ass'n convention under the head of "Question Box," and in addition eighteen general topics were suggested for discussion. The attendance during this discussion was perhaps greater than at any other sessions of the convention, and a considerable number of members contributed ideas and experiences.

Under the question "Do Water Meters Increase or Decrease Cost of Water Supply to Consumers," A. A. Reimer stated that the consumers in his town saved 70 per cent over the flat rates. J. N. Chester said that meters increase the cost to the large consumers and to those with careless servants, but saved it to the poorer families who were without servants and to those whose servants were careful in this respect. C. F. Barrett said that in Salt Lake, those receiving water through 285 domestic meters saved 35 per cent.; saloons and apartment houses were paying 20 per cent more, and the increase to industrial consumers was very high. W. J. Wills said that in Memphis there were 8,000 meters four years ago, and that meter service was so well liked that 8,000 more had been added since then at the request of the consumers.

Under the question as to how the cost of installation and maintenance of meters is borne, Mr. Wills stated that his city pays for meters. C. Faller said that in his city customers purchase the meters from the company at cost and that the revenue is being cut in half. A Canadian member stated that in that country the cities pay for installation and maintenance and that the consumer pays rent for the meter. H. Hymmen, of Berlin, Ont., stated that the city furnishes the meters but the consumers pay for installing them. C. R. McFarland stated that in Tampa, Fla., either the consumer or the city can request that a meter be placed on a given service, and the one making the request pays for the meter. The meter is cared for by the city. The consumer pays less by meter rates than by flat rate. W. C. Hawley stated that Atlantic City has postponed for at least a year or

two an investment of a quarter of a million dollars for increased capacity by installing meters and preventing such increase. J. D. Barnet said that in Stratford, Ont., meters have reduced the domestic consumption. Incidentally he claimed that his city was probably the only one which used only one type of meter, the object of this being convenience in making repairs and renewals, as a few repair parts kept on hand would provide for repairing any meter instantly. Patrick Gear stated that in Holyoke no one wanted meters; water was abundant, by gravity, and any consumer could have practically all he wanted. A flat rate is charged, uniform for all consumers. Robert Elliott said in Nashville with 18,000 services there were 15,000 meters, which had reduced the consumption 25 per cent and increased the revenue 15 per cent. H. P. Bohmann said that in Milwaukee all services are metered, metering having increased the revenue \$3.11 per million gallons. The rate is uniform with no minimum, some consumers paying only 50 cents a year. In one city, a member stated, of 1,917 services which had been metered, the annual payments increased in 714, were unchanged in 97 and had decreased in the remaining 1,106. Jerry O'Shaughnessy said that in Columbus in 1901 the city was pumping 21 million gallons per day. In 1913 only 17½ million gallons were being pumped in spite of the growth of the population which had occurred in the twelve intervening years. The city sells the meter to the consumer, but he does not think that this is a correct practice.

In a brief discussion on "House Services," a member stated that a choked service could be cleaned out by placing in it at the house end a wad of toilet paper about the size of the pipe and forcing it through into the main with a hand force pump. He had cleaned out a 40-foot service in this way, and found no difficulty unless the service was in very bad shape. He had pumped against a pressure in the mains of 75 pounds, running the force pump up to 150 pounds. Mr. Diven remarked that a lead and iron flange connection in the cellar was handy for such work as this. It was said that in Louisville they use rye bread, placing this at the service connection, and forcing it through into the house with the pressure of the mains.

In discussing the best method of making temporary repairs to pavements which had been torn up by the water department, Mr. Diven recommended the use of gravel concrete mixed 1:6. If there was a concrete foundation, a piece of tar paper placed on this would facilitate removing the gravel concrete when laying the permanent wearing surface. Oscar Bulkeley said that in Rockford, Ill., the dirt back fill was well tamped, and in the case of brick streets the brick was put back on this temporarily for ten days and the pavement then replaced permanently.

Discussing whether private fire services should be shut off, in the case of fire in sprinkler-protected buildings, as soon as the fire department is on hand, C. H. Smith argued that it would be better to make sure they are on rather than off, because many fires have been put out by sprinklers, and cases have occurred where the firemen have left thinking a fire was out and it had broken out again some time later, when the sprinklers would come into play. Mr. Diven also believed in sprinklers, stating that there were sections of many buildings which would not be reached by the hose but would be protected by the sprinklers.

The annoying noises caused by water meters, A. A. Reimer believed to be due in nine cases out of ten to a fault in the piping system, which served as a sound transmitter. In one such case the pipes transmitted the noise to the floors, which acted as sounding doors, but

by putting felt between the pipes and the beams all noise ceased.

Concerning whether straight line reading or clock dial meters are preferable, one member stated that it was a question of the man and not of the apparatus; that some men would make mistakes with either kind and others with neither. His company had once paid \$1,100 for the misreading of a dial. A member of Minneapolis said that in that city, where there were 45,000 dial meters and 1,000 straight line meters, the only difficulty they had was with the latter, caused by meter readers adding too many or too few ciphers. Other members stated that a difficulty with the straight reading meter, especially where they read up to the million cubic feet, was that the last numbers got stuck because they were used so seldom, and one at least stated that this was the case even with meters designed to prevent this trouble. Another member had 7,000 straight reading meters and has never had one stick. He favored them because they can be read twice as fast as the dial and with no mistakes. One man in his department reads 7,000 meters once a quarter. The consumers also are asked to read them as checks, and find no difficulty as they probably would with the dial meters. Another member stated that on the back of each bill they have a facsimile of the dials and that a consumer desiring to complain of his bill could mark on each dial the position of the hands and send the card to the office, which would enable them to check up the meter reader.

The discussion turning upon the speed of reading meters, W. J. Wills stated that in Memphis twelve men read 16,000 meters once a month, and A. A. Reimer stated that in East Orange one man will read 125 to 150 meters a day. Later on in the session W. S. Cramer said that in Lexington two men read 5,600 meters in thirty-six hours and the bills are mailed within seven days after beginning reading. This remarkable record of nearly 80 meters an hour is made possible by the fact that the meters all have extension stems and are set at the curb. The reader has a card for each meter which already contains the previous reading so that he needs to read only one or two dials, reading only to the nearest 100 feet. Out of the 5,600 meters there will average perhaps 10 or 12 erroneous readings.

As to the possibility of over-registration of meters, it was apparently demonstrated by a large number of speakers that such things were possible, but uncommon. Patrick Gear said that in Holyoke a 16-inch Premier meter, by having a plank caught in the throat, was so affected as to cause the registration to be doubled or more. Other members recalled instances where a wrong spur wheel in the gear caused a meter to over-register, where a current meter over-registered 50 per cent through a closing of the port and increasing the velocity of the jet on the vane. Mr. Diven told of a displacement meter over-registering by dirt collecting within it; and another said that 3, 4 and 6-inch meters of the plunger type would over-register sometimes 50 per cent after three to six months by a film collecting on the plunger. Mr. Wills said that in Memphis iron sediment had caused meters to over-register by 8 per cent, while A. W. Cuddeback said that sediment on the disc might cause disc meters to over-register, but not more than 5 per cent. W. C. Hawley told of one make of ½-inch meter which has a cast iron casing over-registering 3 to 10 per cent because of iron from the casing collecting on the disc; while another member stated that from one cause or another all disc meters are likely to gain a little at first—possibly 2 per cent—by a film of some substance forming on the disc. On the other hand, Mr. Reimer stated that a disc meter always under-registered

on small streams, and although he had tested a great many on request he never had found one fast. Mr. Gear said that of 3,000 meters tested, he had found only one over-registering and this because of a wrong register; while Mr. Wills said that he withdrew from service an average of 150 meters a month because they were too slow.

In a discussion as to whether meters should register cubic feet or gallons, Mr. Diven stated that gallons were more easily understood by the consumer, while Wm. Luscombe said that they should register in the same unit as the bill read. A. P. Folwell said that of 285 cities, he found 210 using gallons and 75 using cubic feet, and that gallons seemed the logical unit, since it is more easily understood by the consumer and is used in practically every other branch of the water department's service—in designating capacity of pumps, capacity of reservoirs, etc.

Several opinions were expressed as to what instructions should be given to occupants of houses concerning their hot water boilers when the company shuts off the water. One member said that his city disclaimed all responsibility for the house plumbing and would give no advice because, if an accident should result from following such advice, the city might be held responsible. W. H. Buck directed opening the hot water faucet and banking the fires. The danger of the boilers siphoning out was referred to by John Caulfield, who said that a copper boiler would collapse under such conditions, and recommended check valves on the hot water line to save the meter, with a blowoff. Mr. Reimer, however, did not believe in blowoffs because they were so seldom used that they would not work when needed. Another member stated that a danger of the siphoning of the boiler was that it would fill with cold water while hot and explode. Mr. Gear said that he had never yet seen a check which would hold water and prevent siphoning. William Ross recommended the check for another reason—to prevent the meter from running backward, but M. R. Sherrerd said that he had meters fixed so they read forward which ever way they ran.

Discussing the life of small meters, one member set this at twenty-five years; another stated that John R. Freeman uses twenty years in calculating depreciation of water works systems. It was said that the Wisconsin Public Utility Commission also uses twenty years for this purpose. One of the members called attention to the fact that the character of the water had a great deal to do with this, and that considerable iron or turbidity in the water would shorten the life. Patrick Gear told of a meter in Holyoke which had been running since 1874 and had measured thirty million cubic feet. One of his objections to elevators was that they pound the stuffings out of a meter.

As to the expediency of the city or company repairing its own meters, one member advocated sending them to the factory if there should be a broken case, but that any fair mechanic could replace worn gears, clean out meters and make other minor repairs with a small and inexpensive equipment. Mr. Wills believed in making minor repairs only, and sending meters to the factory in large lots for any extensive repairing. The latter require expensive repair shops, and he believed that Memphis was saving \$4,000 a year by this practice. Mr. Cramer said that in his department the meter readers do the repairing at very little cost. In Kalamazoo two men clean, repair and test 150 meters a month.

In discussing the use of plugs on dead ends, Mr. Diven stated that in Troy he found caps used instead of plugs, and that five of these blew off in one year. In Holyoke a plug is used made in two parts which are

fastened together by a bolt in the axis of the pipe, the plug being of such form that by unscrewing the bolt it could easily be removed.

Discussing the question of house to house connections, how often they should be made and whether they should be continuous by a small regular force or should be periodic, A. P. Folwell said that the present practice in 276 municipal plants and 77 private ones was as follows:

Of the former, 38 keep inspectors continuously at work, 228 report periodic inspections, and 10 that no inspections are made. St. Louis has 35 men continuously inspecting house plumbing; Canton, Ohio, 2 regular men and an occasional extra man, and Harrisburg, Pa., 2 inspectors continuously. Inspections once a month are reported by 14 cities; quarterly inspections by 18; twice a year by 8; annual by 18; while other cities made inspections once in two years and once in three years. A number of cities where a considerable proportion of the services are metered do not inspect the metered services.

Of the private plants 10 report continuous inspection by a permanent force and 67 periodic inspections. Monthly inspections are reported by 3, quarterly by 1, annual by 7, biennial by 2 and one inspects once in five years; 6 inspect "occasionally," one "frequently," and another "when complaint is made."

MILWAUKEE DESTRUCTOR PLANT.

We are glad to give space to the following letter to correct what was apparently an incorrect statement of the Milwaukee correspondent who was responsible for the news item referred to:

June 5, 1914.

Editor Municipal Journal,
50 Union Square, New York City.

Dear Sir:

We find in your issue of April 30, 1914, a note under the caption "Electric Plant Connected with Garbage Incinerator Fails," which conveys the impression that the difficulties encountered in properly flushing the Milwaukee River tunnels are due to the inability of the destructor or incinerator plant to furnish sufficient steam.

We have kept closely in touch with the destructor plant, which we built in Milwaukee, ever since it was put into operation and, realizing that something must be wrong with the operation if sufficient steam to run the generating plant installed was not forthcoming from the destructor, we had one of our engineers go to Milwaukee and investigate, and he reports that the superintendent at the destructor plant informed him that the plant is furnishing all of the light for McKinley Park and, in addition, taking care of the flushing of the sewer tunnel and then has considerable power to spare. The superintendent further stated, however, that frequently the wheel for flushing the sewer tunnel gets out of order and that it is necessary to shut it down for repairs. The trouble apparently exists in the bearings, and the day before our engineer visited the plant in Milwaukee orders had been received at the destructor to shut down in order to permit of repairs on the wheel. Our engineer further reports that the 600 kw. turbine was running up to capacity at the time of his visit and that the steam pressure was steady at 140 pounds.

At times during the summer months, the quantity of ashes and rubbish delivered to the plant is so small that it is necessary to use additional fuel in order to consume the garbage and supply the steam required by the power plant. At such times a very cheap grade of coke breeze is used, which can be had for practically the cost of delivering it at the plant, but no additional fuel of any kind is required until the proportion of garbage exceeds 80 per cent of the total refuse delivered.

You will see that the facts, as we have outlined them above, do not agree with the impression given by the note in the Municipal Journal of April 30th, and we would be glad if you will make such correction as you may see fit.

Very truly yours,
THE DESTRUCTOR COMPANY,
Power Specialty Co. Manager.

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CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

JUNE 11, 1914.

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Responsibility of Owners for Fire.

More than half of the millions of dollars which go up in smoke each year could be prevented if owners would use well known precautions in constructing their buildings and in conducting their business; therefore those neglecting these precautions are responsible for the loss, and should be made to pay it. This is in brief the theory of Joseph O. Hammitt, chief of the New York City Fire Prevention Bureau, which he presented before the Mayors' Conference in Auburn, N. Y., last week. His idea would be to compel any man on whose premises a fire started to pay the cost of extinguishing the fire and also any damage to the property of others.

This idea has, we understand, been tried abroad and has already been put in practice in a trial case in this country. "We have," said Mr. Hammitt, "in the New York City charter a provision under which we think that if a fire occurs or spreads because of the absence of precautions required by law or by lawful orders of the fire commissioner, the owner of the premises or person responsible for the violation is liable for the cost of putting out the fire and injuries to firemen sustained in fighting it." Under this provision the commissioner has brought suit to recover the cost of putting out a "smoke" fire where a sprinkler equipment had been ordered in but not installed, and expects to sue also for injuries to the firemen.

If this theory of responsibility is sustained by law it would seem as though fire insurance would become unnecessary, for the owner on whose property the fire originated would really pay for the loss (if he were financially able after his own loss). But we suspect that juries would be hesitant about placing such burdens on an individual where gross carelessness is not proved. And how about incendiary fires, and those due to carelessness of employees?

The idea is an interesting one, but it presents many complications, and the results obtained by the fire commissioner in New York will be watched with interest.

Utilizing Incinerator Heat.

Plants at home and abroad have demonstrated that it is not at all impracticable to obtain steam from the heat generated by refuse destructors, and given steam, there are of course numerous ways in which it can be used. But as a matter of fact, Milwaukee is perhaps the only city in the United States to actually make continued and regular use of such steam power, except for lighting and operating the plant itself. This is unfortunate, and in most cases unnecessary and due to prejudice or selfish opposition of municipal officials.

But there may well be cases where a use for the heat is not at once evident except by objectionable competition with private interests. A letter on another page relative to the Milwaukee plant, in which it is stated that during the summer months a scarcity of household ashes and rubbish sometimes makes the use of auxiliary coal necessary, suggests that the steam from such a plant might be used for central heating of buildings within a greater or less area around the plant, since this demand would greatly decrease in summer, and only so many need be taken on as could be properly heated; while in lighting or other service it is generally the case that the service required is fixed and greater than the destructor can supply unaided.

Another suggestion is the use of the heat in drying sewage sludge instead of creating steam. In many cases the artificial drying of sludge would be desirable, but is not to be thought of because too expensive; but if we have heat going to waste in a refuse destructor plant, ing appliances only, and these are not expensive. The dried sludge can be burned and might possibly be of aid, even, in keeping up the destructor fires when other readily combustible matter is wanting. At any rate, since the disposal of sludge is still the most difficult problem in sewage disposal, drying it is a considerable step toward inoffensive disposal by burning, filling in land, etc., if not for utilization in gas producers or otherwise.

Engineers, sanitary and mechanical, have gone a long way toward solving the problem of creating heat from refuse: but before their conclusions and appliances receive general adoption they or some one must take the steps necessary to provide for the use of this power, and this would seem to require the talents of the promotor or politician rather than of an engineer. The power is there, the methods of using it are numerous, but the powers that be simply refuse to use it. At least, this would seem to be the conclusion from the reports given out, both preliminary to construction and during operation.

Whatever the facts of the case, if the power is not to be used it is worse than useless to provide the means for creating it; for such means are expensive and the taxpayers' money should not be spent to no purpose. Boilers and settings, auxiliary grates for coal, and other features of a destructor plant are provided only with a view to creating steam; and thousands could be saved by omitting them and reducing the size of the building.

Even the lighting of the plant and the small amount of power required to run it could generally be obtained more cheaply from a local light and power company.

But the power is there, it is of value and apparently available, and we believe that the people will soon come to see in this one opportunity for the "conservation of resources" which is receiving so much attention these days.

ST. PAUL REFUSE DISPOSAL.

Last year a committee representing the city council and citizens of St. Paul, Minn., was appointed to consider the subject of municipal garbage and refuse disposal. The committee has prepared a report, which has recently been made public, in which it recommends that the refuse be collected in two classes, one including garbage, floor sweepings and all burnable rubbish; the other including ashes and unburnable refuse. Each householder would use two cans and separate his refuse as indicated.

"As garbage contains 70 per cent of water, any method which will remove a portion of this water before dumping into the furnace will reduce the amount of heat used for evaporating this water and increase the amount of heat available for making steam. The committee therefore recommends that all garbage be drained by the householder and wrapped in paper before being placed in the garbage can. Furthermore, experiments have shown that small packages of garbage dropped into the furnace are more readily consumed than large masses packed together. It also recommends that garbage by the jolting of the wagon will run, thus separating a large amount of water before reaching the incinerator. This water can be drawn off into the sewer before the garbage is dumped.

"It is estimated that the city of St. Paul will produce daily 80 tons of garbage, 64 tons of rubbish, 26 tons of street sweepings and 140 tons of ashes, or approximately 170 tons of burnable material and 140 tons to be taken to the dumps.

"As the hauling of refuse is the larger expense, and is a continuous daily cost, any method which will shorten the haul will reduce the cost of the collecting system. It is therefore recommended that the city be divided into four districts, and that incinerators be constructed in each district, one of 80 tons capacity in the down-town district and 3 of 40 tons capacity in the outlying districts. These incinerators should be built one at a time and the collecting system fully organized and tried out for each before building another.

"The district bounded by the circle which has a radius of one and one-half miles contains a population of 80,000 people and will produce approximately 70 tons of burnable refuse; (30 tons of garbage, 24 tons of rubbish and 16 tons of street sweepings). This district will take care of 90 per cent of the garbage which the health department now have trouble in disposing of."

The committee estimates that an 80-ton incinerator in two units, with a 150-h. p. boiler, and building of pleasing architecture can be built for \$55,000. The daily operating expenses at full capacity they estimate as \$24 for 12 stokers, \$6 for 3 dump men and \$10 for 3 engineers, all operating in three 8-hour shifts; or a total of \$40 a day.

It is suggested that the 150-h. p. of steam generated be used for heating and lighting the auditorium and the combined court house and city hall; the former requiring 1,900 lbs. of condensation per hour for heating and the latter 6,800 lbs., in the coldest weather; while the former use a maximum of 130 kwh. for lighting and the latter 73.

Adding to the operating cost interest on the investment at 4 per cent and depreciation at 10 per cent with \$1,000 for incidentals, the committee estimates the annual cost at \$23,300. It estimates a revenue from steam for heating of \$11,340, and a net cost of \$11,860, or 46½ cents per ton when 25,550 tons a year are destroyed.

At present the city collects about one-half of the garbage and disposes of it to farmers or on dumps, the other half being collected by licensed collectors. Individuals dispose of their own ashes and rubbish.

REFUSE DISPOSAL IN EASTON.

The plant and outfit for refuse collection and incineration in Easton, Pa., and the operation of them have been described in Municipal Journal (December 28, 1910; October 24, 1912). The incinerator is a Morse-Boulger built in 1910, consisting of two 17½-ton units. The following figures concerning the operation of the incinerator in 1913 and the collection of the refuse are from the annual report of C. A. Reese, city engineer:

The salaries and wages totaled \$11,830.09, of which \$3,991.04 are wages of ash collectors and \$4,027.46 those of garbage collectors. Others are: \$900 for stableman and foreman; 780 for furnaceman, \$915.04 for extra firemen and \$212.79 for extra help on the floor; \$726 for watchman, and the balance for hauling and office work. The mules cost \$1,716 for feed, \$46.75 for veterinary services, \$248.90 for shoeing and \$55.62 for sawdust (plus \$15.96 for hauling the last). The coal used (202.43 tons) cost \$310.89 plus \$443.50 for freight and \$57.37 for hauling. Repairs to the furnace cost \$232.45 for brick, \$9.36 for grate bars, and \$53 for labor and other materials—a total of \$294.81. Repair to wagons and harness cost about \$450, and other maintenance charges about \$178.13.

The material collected comprised 4,847 loads of ashes, 3,861.29 tons of garbage and rubbish collected by the city's teams and 1,058.26 tons brought to the plant by private teams. Mr. Reese compares the operation of the plant last year with that of the year before as follows:

Total Expenses.			
	1912	1913	Difference.
Salaries	\$11,880.06	\$11,830.09	—\$49.97
Care and feed of mules	2,533.78	2,067.27	—466.51
Water, light and telephone	185.70	68.26	—117.44
Coal	858.70	754.39	—104.31
Miscellaneous	1,345.31	922.94	—422.37
	\$16,803.55	\$15,642.95	—\$1,160.60

Quantity of Material Disposed of.			
Garbage and rubbish (city teams)	3,474.36T	3,861.29T	+386.93T
Garbage and rubbish (local teams)	944.3T	1,058.26T	+113.96T
Ashes	4,985 Loads	4,847 Loads	—138 Loads

Cost of Collection.			
	1912	1913	Difference.
Garbage and rubbish	\$4,732.40	\$4,240.26	—\$492.15
Ashes	3,969.63	3,991.04	+ 21.41

Coal Consumed.			
Coal	334.24T	202.43T	—131.81T

These figures give, for 1913, \$1.10 per ton for collecting garbage and rubbish and 82 1-3 cents per load for collecting ashes. Eight and one-quarter pounds of coal were consumed, on the average, per ton of refuse burned, costing 16½ cents per ton burned.

"The reduction in cost of collection is due principally to the strict enforcement of the rules for the collection of garbage and demonstrates that the people themselves, by co-operating with the department, can very materially reduce the cost of maintaining the same."

While the capacity of the plant is rated at 35 tons in 24 hours, on September 8, 1913, 42 tons of garbage and rubbish were consumed in 19½ hours—the highest record of the plant up to January 1, 1914,

The WEEK'S NEWS

Boston and Baltimore Street Improvements—Road Work in Denver—Lincoln Highway Change—Metering and Water Conservation—Urbana Lighting Contract—New Auto Apparatus in Many Cities—Street Cleaning in New York—Toledo Car War—Philadelphia Rapid Transit.

ROADS AND PAVEMENTS

\$400,000 for Boston Streets.

Boston, Mass.—After more than a month's delay, the City Council has appropriated \$400,000, or half the amount desired by the mayor, for new street laying out, and has indicated its disposition to make another large sum available, before the summer recess. For the last ten years or more the only money that the city has spent in laying out and constructing streets in the outlying districts has come from the \$300,000 loan, though the petitions for such street work have been piling up until nearly \$2,000,000 would be required to meet the present demands of citizens that the street commissioners would like to respect. Mayor Curley recognized the strength of the property owners' appeals and stated plainly to the council a few weeks ago that he would not approve an appropriation of \$500,000 to widen a half-dozen streets as named by the council, but desired the loan provided under the Horgan act used for the construction of new streets, in order that a good start might be made during his first year of office. It is the prevailing opinion that the City Council will recede from its long-standing position and give relief to small property owners. The department of public works has thirty street resurfacing jobs under way at present, requiring an expenditure of more than \$300,000 and ranging from \$60,000 for the Norfolk street paving to \$350 for Midland street, all being of bitulithic with the exception of two.

New York State Road Begun.

Massena, N. Y.—A. A. Bennett of the firm of Barnard & Bennett, sub-contractors under Rhody & Clawson, have commenced work on the Massena village division of state highway route No. 32. John H. Whalen of Louisville is state inspector and William L. Jones is resident engineer. The village of Massena is now bonded for \$55,500 its portion of cost for this section of road a distance of 1.72 miles. For 750 feet of the distance the brick pavement will be 40 feet wide; the remainder 30 feet wide. The contract calls

for the excavation and removal of 14,931 cubic yards of earth, 45,000 cubic yards concrete foundation, 233 tons broken stone, 3,727 square yards brick pavement, 19,074 linear yards concrete curbing.

West Virginia "Good Roads Day."

Wheeling, W. Va.—Governor Hatfield, his staff, many state officials, approximately 40,000 men, 10,000 teams and half the convicts in the state penitentiary worked on state roads in celebration of "Good Roads Day" under the slogan "Pull West Virginia out of the mud."

Urge Lincoln Highway Change.

Washington, D. C.—Delegations of business men of Washington and Baltimore are urging President Wilson to exert his influence to have changes made in the proposed route of the Lincoln Memorial Highway, so that it would pass from Philadelphia through Wilmington, Del., to the national capital. The route as now outlined runs from Philadelphia through Lancaster, York, Bedford Spring to Pittsburgh, and does not take in Washington. The President advised the delegations to prepare a letter to the Lincoln Highway Association, setting forth the arguments in favor of the desired change, and indicated that he would be inclined to sign such a letter. Washington was represented by a committee of 25 appointed by the Chamber of Commerce and Board of Trade. The change in the route was urged on the ground that it would be unfitting for the memorial highway not to pass through the national capital, where Lincoln accomplished the greatest achievements of his career.

City Buys Rock Crusher.

Denver, Colo.—The city has installed a new rock crusher to be used in connection with the new and repair work on roads this year. The crusher is in operation at the old Grant smelter, where the city is crushing slag. The slag is bought at eight cents per yard. The crusher, made by the Indiana Road Machine Co., of Fort Wayne, Ind., is shown at work in the illustration.



Courtesy "City of Denver," Denver, Colo.

DENVER'S ROCK CRUSHER AT WORK.

Break Up Street Before It Is Finished.

Baltimore, Md.—With the tar still warm between the belgian blocks and the city men finishing up one of the ends, paving employees of the Consolidated Gas Electric Light and Power Company began tearing up the newly laid pavement and digging a four-foot trench on Light street, between Pratt and Lombard. Inquiries from the men in charge of the gang elicited the information that they had their permit in due form, while the city men stated that they had been given instructions to repair the street and they would repair it. They finished their job as the gas men started on the first work of tearing up and then went to the other side of the street to do repairing there. At the office of the City Engineer it was stated that orders had been given to repair sections of Light street, and that they knew nothing about the permit. It was asserted that the agreement the city had with the Gas Company was that the company must put the street in the same order in which it was found. It was explained that on questions of repairing streets it was not always possible to have the work done after the trench was opened as was customary when a new street was to be laid. According to the Gas Company, when the city started the repair work on Light street it overlooked the fact that an application was pending from the Gas Company for a permit to dig up that street. The illustration shows the men tearing up the blocks.



Courtesy Baltimore (Md.) News.

TEARING UP BLOCK STREET IN BALTIMORE.

New Steam Roller.

Niles, O.—The new steam roller recently bought from the Good Roads Machinery Company of Pittsburg has arrived in the city and the company's representative is here to turn it over into the hands of the Street Department for a sixty days' trial, during which time the city officials will test it in every way in which they may be able to use it. An engineer for the company will stay in the city for a week to teach the city's men how to operate the machine. It is intended primarily for the Street Department, but of course will be used wherever there is need.

Steals a Road.

Dover, Del.—Search is being made for a thief who is charged with stealing a part of a road. Undaunted by proximity of farm houses, an unidentified man halted a wagon on a county road and began transferring the roadbed of sand into his cart. He made several trips in the course of two days and is believed to have sold the sand at Kenton for \$3 a load. He excavated so industriously that he cut a big gully in the thoroughfare, a fence was undermined, the posts and rails falling into a ditch, while the road cannot be used for traffic. Lawyers say a charge of "stealing a road" would be applicable.

A Bridge-Strengthening Feat.

New York, N. Y.—What one of the engineers described as "the most difficult feat of engineering ever attempted on any bridge" was accomplished in the strengthening of the Williamsburg Bridge for traffic purposes. A crew of electricians, machinists and engineers of the city under the direction of Consulting Engineer A. L. Bowman, drilled the steel girders under the tower of the Brooklyn side of the Williamsburg Bridge to substitute a larger "end-pin."

Engineers have been working for two years on the plans. The purpose of the work is to strengthen the bridge for the subway trains which will be run upon it. The greatest obstacle in the way of reinforcing the bridge has been that of substituting four "end-pins," which virtually form the keystone of the steel work in the four sections of the bridge. The ends of the steel girders which are the chief support of the bridge meet and lock on the "end pins." The old "end pins" are 10 inches in diameter. To strengthen the bridge it was found necessary to substitute 13-inch pins of steel, 40 inches long, and weighing 1,500 pounds, and to drill out the ends of the steel girders to make holes big enough for the larger pins. The new pins were tested in a structure specially built to bring them under the same strain to which they will be subjected when the subway trains pass over the Williamsburg Bridge. With the bridge temporarily braced with steel supports, the old pin under the tower on the Brooklyn side of the bridge was removed after the bridge had been closed to pedestrians. During the day the new pin and the drilling machinery were swung into place. Commissioner Kracke, a number of city officials, and most of the city's engineers were present when the time came to cut out a place for the new pin. The work began 12:28 in the morning and was completed by 5:15, when the bridge was opened to traffic.

Work on Model Cement Highway.

Denver, Colo.—Work has begun on the one-mile stretch of model cement road to be built jointly by the park board and the Colorado Portland Cement Company, assisted by the United States Portland Cement Company, stretching westward on Sheridan boulevard from the boundary line of Jefferson and Arapahoe counties. This section of road, to be built according to the most modern methods in concrete work, will cost between \$12,000 and \$15,000. Of this amount \$7,000 is to be paid from the "mountain parks fund." The remainder is to be contributed by the cement companies to provide a sample of concrete road work. The excavation and draining of the road bed will be carried on by the park commissioners. The construction work will be done by the Colorado Portland Cement Company under the direction of the expert engineer of the American Association of Portland Cement Manufacturers, sent here from Philadelphia.

SEWERAGE AND SANITATION

Sewer Gas Explosion in Screen House.

Boston, Mass.—A terrific explosion of sewer gas in the screen house of the Metropolitan sewerage pumping station at East Boston caused three deaths, shook buildings for a mile around and did damage close to \$100,000. Besides the three dead, one man is missing and eight are injured, four of whom are on the dangerous list and may die. The explosion completely demolished the screen house, a structure 25 by 40 feet, built of brick and steel. The great pumping engines were put out of commission and a large part of the sewerage disposal system of Greater Boston was put temporarily out of business.

Typhoid Danger in Grove City, Pa.

Grove City, Pa.—Residents of Grove City are fearful of a second typhoid fever epidemic in that town due to a number of cases of typhoid which have been reported during the past several days, one of the cases resulting in death. On account of the town just passing through a bad epidemic in which there were a large number of cases as well as quite a few deaths the residents of that town are considerably excited at present, and the matter has been reported to the state board of health, which has sent representatives to that place. Since the last epidemic, which occurred during the winter months, all of the water mains have been flushed regularly and new wells are being drilled for the water supply of the town. All of the water is furnished through the water plant, which is owned by the municipality, being taken from drilled wells. Officials of the city are of the opinion that the cause of the present cases of typhoid is not from the water supply, but is from other causes, one of which is the ice, which it is claimed

was taken from the dams near the town, which may have been infected from the sewers.

WATER SUPPLY

Meters for Water Conservation in Allentown, Pa.

Allentown, Pa.—In its campaign to lessen the extraordinary consumption of water in this city, which for ten years has every summer threatened and several times has brought on water famines, the City Council, through the Water Department, is having meters installed for the metering of water supplied to some of the largest consumers. The gradual metering of all the big consumers is looked upon as the solution of the difficulty temporarily, and the work along this line will proceed rapidly. Council is understood to be considering the advisability of repealing an ordinance adopted five years ago making it optional upon large consumers whether they shall pay a flat rate or have meters installed. Where water was being used in large quantities, the opinion invariably was exercised in favor of no meter. It is also likely that sprinkling will have to be discontinued until at least there is less consumption in other directions. With the city's population growing at the rate of over 2,000 a year and the per capita daily consumption 150 gallons, there has come an increased consumption of 300,000 gallons daily. In the meantime, Schantz Springs continues its flow of 8,000,000 gallons per day as it did ten years ago and Crystal Spring 5,000,000.

Mysterious Water Loss.

Allenhurst, N. J.—Members of the city council are discussing the mystery of the deficit in the boro water department, caused by a pumpage that exceeds by thousands of gallons what it is believed it should be. The problem awaits solution in the report of a water expert who has been investigating the situation for several weeks. Councilman Dodge has the water question in hand but admits he is at a loss to find out where the water goes.

Excavator Digs Up Pipe.

Pasadena, Cal.—South Pasadena's huge automatic ditch digger, which is putting in trenches for the new sewer system there is badly damaging the water pipe system. When it comes to a water pipe the pipe is scooped up with the dirt. This is vexing the Pasadena water department, which owns and operates these pipes. The matter has come to a crisis, for the city of Pasadena does not purpose to relay the pipes at its own expense. South Pasadena will be asked to defray the cost of workmen to be employed by Pasadena to go ahead of the power digger, remove the water pipes and relay them after the ditch machine is safely by. As an alternative suggestion, Pasadena asks that the ditch digger skip the places where the water pipes are and that the work of digging a ditch by the pipes be done by hand. It is believed that South Pasadena will consent to one or the other of the two plans suggested, but if it does not Pasadena will probably seek an injunction or restraining order to prevent the tearing up of the water pipes by the roots.

City Buys Water Works.

Eugene, Ore.—The little city of Coburg has voted to purchase the private water works system owned by H. F. Bucknum and sold \$13,500 worth of bonds for this purpose. The system consists of a well, gasoline pump and a mile or two of mains. The city will extend the mains and furnish water as near cost as it is possible to do so.

Water Famine in Dayton Section.

Dayton, O.—Scarcity of water in the higher districts in Dayton View has been giving the city authorities much concern during the hot weather, and the trouble will increase unless the pressure at the wells can be increased so that the water can be carried to higher altitudes than in the past. Notwithstanding the fact that the department is doing record pumping, about two-thirds of the territory is not being supplied with a sufficient quantity of water. This is due to the fact that the pressure at the pumping station is insufficient. Two pumps have been removed from the Linden avenue station and with these the force will be

augmented at the central station. It is hoped that the wells at Tate's Hill may be connected up, and this will increase the supply approximately 5,000,000 gallons daily. However, there is some danger that the pipes about the city which are gradually becoming worn and weaker may prevent increasing the pressure in any considerable degree for fear that the pipes will be unable to withstand it. The general impression prevails that the only way to fully remedy the situation would be to construct a direct line from the pumping station to the Dayton View standpipe. This will eliminate the danger of bursting pipes throughout other sections of the city. Arrangements could then be effected whereby the standpipe would be filled at night and this would not interfere with the quantity of water to be supplied the other sections in the daytime. City Manager Waite has asked for a report from the Water Department each day so that he may be able to keep in close touch with every detail.

Sprinkle in Spite of Flat Rate Law.

Hamilton, O.—Service Director Joe Meyers and Water Works Superintendent Sam Nelson, after investigation have found over one hundred cases of customers of the water department who have been sprinkling streets while they were paying a flat rate for water. This is expressly forbidden by laws of the department, and in every case the offenders were ordered to have meters installed within five days, or the city water would be cut off. The officials will continue their watchfulness for several days and expect to find many more places where meters will have to be installed.

Tenant Need Not Pay Water Tax.

Nashville, Tenn.—Construing as illegal an ordinance of the city which provides that delinquent water taxes, accumulated by landlords, shall be paid by tenants, with the alternative of shutting off the water supply, Judge Thomas H. Matthews handed down an opinion in the Third Circuit Court in the case of the state ex. rel. Lola Flannigan against the city of Nashville, peremptorily commanding the city to furnish the defendant with water. The opinion not only involves a unique point of law, but marks a sweeping victory for tenants, who in the past have been compelled to pay delinquent water taxes accumulated by the landlords rather than have their water supply cut off. In the present case the tenant sought to have the water meter placed in her name when her landlord refused to pay the water tax, but her request was denied, it is stated. She was advised that unless she paid the water tax accumulated by her landlord, the meter would be taken out. Through her counsel she entered a mandamus proceeding against the city, which was sustained by Judge Matthews. The case was appealed by the city to the Court of Appeals.

STREET LIGHTING AND POWER

Gas Company Voluntarily Reduces Rate.

Jacksonville, Fla.—The gas company has again voluntarily reduced the rates. Six times before, in the past seven years, the price of gas for illuminating, domestic and industrial uses in Jacksonville has been reduced, and each time voluntarily by the company. The net price for domestic purposes is \$1.15 per thousand. Seven years ago the price was \$1.50 per thousand, and there has been a reduction annually of 5 cents per thousand.

A Ten-Year Light Contract.

Urbana, O.—The City Council at a special meeting voted to grant the Urbana Light Company a new franchise for a period of ten years. The recommendation in substance as adopted by council is that the Urbana Light Company will furnish, maintain and operate for the lighting of the streets, etc., not less than 100 four-ampere metallic flame arc lights and such incandescent light as the city may require of 100 nominal candle power, and also such ornamental arc standards and incandescents as may be required. The ornamental standards are to support two 50-candle power and one 80-candle power or four 50 and one 80-candle power lights. The 50-candle power lights are to be

kept burning until 11 o'clock each night and the 80-candle power all night. All other lights are to burn from dusk until dawn. The metallic flame arc lights are to cost \$57.50 a year per light; the incandescents \$25 a year, the 3-light ornamental \$40 a year, the 5-light ornamental \$56. The commercial rate as recommended by council will be 9 cents for the first 50 kilowatt and 9 cents less for each additional 50 kilowatt up to 1,000. Over 1,000 will be charged at a 3-cent rate. The minimum rate will be 50 cents. A discount for prompt payment will also be allowed. The city solicitor was instructed to prepare the necessary legislation granting the franchise embodying in it the recommendations of the council.

Cactus Design for Light Poles.

Tucson, Ariz.—Ornamental lights carried on standards in the form of a gigantic Sahuara cactus is the novel suggestion made to the Chamber of Commerce by J. D. McKay, of Tucson. Mr. McKay has been struck by the beautiful manner in which the ornamental street lights of San Bernardino, Cal., have been arranged, and the idea came to him that a novel idea would be to have the street lights of Tucson arranged on standards which were modeled after the form of the giant Sahuara cactus. He has submitted drawings to the Chamber of Commerce which express the idea.

FIRE AND POLICE

Indiana Fire Report.

Indianapolis, Ind.—An average of one fire for every 435 inhabitants has occurred throughout Indiana during the first eight months of the existence of the fire marshal department. Floyd County leads all others in the frequency of its fires on the basis of population. Sullivan, Monroe and Wabash Counties also show high averages. Marion, Vigo and Vanderburgh Counties show the largest number of fires reported during the eight months.

Fire Hose Cut by Trains.

Buffalo, N. Y.—The fire commissioners at a special meeting directed Chief McConnell to investigate the cutting of four lines of hose that had been stretched across the Central tracks at Alabama street during the burning of the Buffalo Lounge Company's plant. According to the firemen a railroad engine ran over the hose without warn-

ing. There was a water pressure of 240 pounds in the lines at the time and fire steamer was carrying 180 pounds of steam. The cutting of the hose caused the suction hose of one engine to be pulled off the hydrant and the steamer was dragged twenty feet forward and fell against an electric light pole. All the connections and the main steam pipe were broken and two of the crew were scalded. When the pipe connections broke the supply of water to the

Richmond Has Good Fire Protection.

Richmond, Ind.—Fire Chief Miller, the city officials and citizens generally are very much pleased with the report of the National Board of Fire Underwriters for 1913. In fire protection Richmond stands well in the list of cities. The city was about even with others in the number of fires per 1,000 population—about 5.67. These fires were generally small so that the fire-loss is only eleven cents per capita. Of the eleven cities in Indiana with 20,000 or more population only Richmond and Gary were given 100 per cent. for keeping fires confined to place of origin. Chief Miller gives a great amount of credit for the good record to the fire truck purchased two years ago.

MOTOR VEHICLES

Auto Chemical of Springfield, Mass.

Springfield, Mass.—The city now owns a 2,500 pound capacity hose and chemical wagon equipped with a couple-gear four-wheel drive made by the Couple-Gear Freight Wheel Co. of Grand Rapids, Mich. The outfit, shown in the illustration, has a seating capacity for ten men, is provided with a tool desk and gives a speed ranging up to thirty miles an hour.

Wilkes-Barre's New Auto Flusher.

Wilkes-Barre, Pa.—Curnow & Murray, cleaning the streets of the city, have had constructed from special designs prepared by Robert B. MacCallum, of MacCallum & Co., of Wood street, a motor driven combined flushing and sprinkling apparatus, set on an automobile truck for the street cleaning service. A feature of the design is the utilization of a separate sprocket gear driven to operate an American centrifugal pump through a clutch, which permits the pump to run whenever the motor is in operation or the clutch can be thrown out and the pump stopped as the occasion requires. The operation of the pump and sprinkling valves are controlled by levers in the cab. The pump has a capacity of 250 gallons per minute. It discharges through a three-inch pipe to a point midway between the wheels, where it branches to a Hvass flushing nozzle, 8 inches above the pavement. The tank has a capacity of 1,200 gallons. The nozzle pressure reached up to 80 pounds but ordinarily a pressure of 30 pounds is the maximum used. The outfit is mounted on a 5-ton Mack truck. Ordinarily the speed is about 6 miles per hour. Representatives of the street cleaning departments of Scranton, Harrisburg and Williamsport are expected to arrive in this city to inspect the flusher.



SPRINGFIELD'S AUTO CHEMICAL.

ing. There was a water pressure of 240 pounds in the lines at the time and fire steamer was carrying 180 pounds of steam. The cutting of the hose caused the suction hose of one engine to be pulled off the hydrant and the steamer was dragged twenty feet forward and fell against an electric light pole. All the connections and the main steam pipe were broken and two of the crew were scalded. When the pipe connections broke the supply of water to the

New Auto Engine Accepted.

St. Augustine, Fla.—City council has accepted the new La France automobile fire fighting apparatus. Alderman Center and Jones of the fire and police committee and Mayor Corbett submitted a signed report recommending the acceptance of the truck. The machine stood all tests in running through sand and in throwing water for a long distance, and the council adopted the report.

Two New Tractors for New York Fire Department.

New York, N. Y.—The New York Fire Department has had delivered two Garford tractors, the standard 3-ton model, attached to water towers which were previously horse-drawn. In motorizing the water towers the end part of the rocking fifth wheel was built of a size to match the upper half of the horse drawn vehicle and to provide the usual King bolt connections. The arrangement of the water tower mechanism puts all the weight on the tractor and a separate arrangement was provided to handle this strain. This was done by means of auxiliary jacks between the frame and the spring, so that when the weight is on the tractor, the jacks relieve the springs and give a firm foundation since the weight rests directly on the axles. On delivery, the tractors passed the Commissioners' tests, maintaining a speed of 15 miles per hour for one hour steadily without heating or signs of undue strain on the motor or other parts and climbing specified hills at a speed not less than 6 miles per hour. The Garfords passed the tests very satisfactorily, doing 7 miles an hour on the hills, and were immediately put into commission. The water towers are of standard type, hydraulic-raised, with a 65-foot extension, with the pipe of telescope pattern. One of the towers was made by the Seagraves Company, Columbus, O., and the other by the Fire Engine Mfg. Co., of Chicago, Ill. They were bought in 1898 and have given excellent service since.

Buys Trucks for Road Work.

Watertown, N. Y.—About \$10,000 has been spent by the local state highway office recently for equipment for the maintenance department. Two large Packard trucks costing approximately \$7,500 have been purchased and also a large steam roller. The latter cost about \$2,200. Division Engineer T. E. Ripley has announced that the department was planning to have a long detour for automobile traffic coming from Syracuse and Oswego to Watertown.

Washington Motorizing.

Washington, D. C.—Rapid progress toward the complete motorization of the Fire Department of the District of Columbia will now be made, following acceptance by the Commissioners of two pieces of fire apparatus, an engine and truck wagon, which had been converted from the horse-drawn to motor-propelled type. Commissioners Newman and Siddons rode on the truck, and expressed satisfaction over the result of the test. The two fire-fighting wagons, which have been in the service of the department for a number of years, are the first to be provided with front-drive tractors. Provision is contained in the District appropriation bill, which is pending in conference, for the motorizing of additional apparatus. There are a number of engines available for the purpose, and it is expected that each appropriation bill will provide the necessary funds until the horse-drawn vehicles have become obsolete. The engine and truck wagons just inspected were provided with the tractors at a cost of \$3,675 each. The work was done by the Front Drive Motor Company of Hoboken, N. J. Chief Frank J. Wagner and T. M. Robinson, superintendent of machinery, witnessed the tests and recommended acceptance of the apparatus.

Auto Truck Tests.

Holyoke, Mass.—The two combination fire auto trucks and a tractor, acquired recently by the city at a cost of about \$22,000, have been officially tested. The object of the test was to ascertain the power of the machines rather than the maximum amount of speed. The machines were tested under the conditions that will exist in real service, a full complement of fire-fighters being carried in addition to the usual equipment. Fire Commissioners Dr. G. C. Roberts, chairman, Sidney E. Whiting and J. H. O'Connell, and clerk, John Hildreth, trailed the wagons and tractors in touring cars. American-La France machine responded well

New Patrol Auto.

Freeport, Ill.—Freeport's new combination auto patrol and ambulance has reached the city, having been driven out from Chicago and is now ready for use. The auto patrol is of Buick make and was contracted for by the city



NEW YORK'S WATER TOWER WITH GARFORD TRACTOR.

through Stephan & Hartman, the local agents, after competitive bids were submitted. The cost is \$3,250. The trip demonstrated that the car was up to all expectations and at some stretches in the road a speed of 50 miles an hour was maintained. The vehicle is entirely enclosed, with the exception of the seat for the driver which has a covering extending over it. The space back of the driver is eight feet, giving accommodation for seven persons on each side. It is quickly converted into an ambulance. It is electric lighted throughout and is equipped with electric push buttons and other conveniences. The car weighs 4,200 pounds and is equipped with six cylinders. It is 48-horse power, although it will develop 66-horse power by brake test. The wheels are 37 by 5 and have special puncture proof tires.

Wilmington's New Auto Apparatus.

Wilmington, Del.—The city's automobile fire apparatus has received two new additions with the arrival of the tractor of the Independence Company and the combination chemical of the Liberty Company. The machines were built by the La France Fire Apparatus Company, of Elmira, N. Y. This firm is also making a new steamer and tractor to the Liberty and a combination apparatus to the Independence companies. These are expected shortly.

GOVERNMENT AND FINANCE**A Debtless City.**

Sterling, Colo.—Sterling is perhaps unique among cities of Colorado in that it is entirely free from debt. The call for all warrants registered to date, completely liquidates the city's last item of indebtedness. Three years ago, when the present administration assumed office, warrants were more than one year behind, and there was an accumulated indebtedness of \$2,500.

Boston Revives Sign Tax.

Boston, Mass.—The city authorities revived an old ordinance by levying taxes varying from 25 cents to \$1 on all advertising signs on buildings, fences and roofs. A census of the signs, including size and location, was made by policemen. The fact that advertising signs are subject to fees was not discovered until recently. Mayor Curley hopes to add several thousand dollars to the municipal income as the result of the levy.

Proposes City Planning Commission.

Rome, N. Y.—A new ordinance presented by Mayor Midlam, calls for a City Planning Commission of seven members. Not more than one-third of the members shall hold any other public office, they shall have no compensation, and shall have no power to expend money. They will act on request of other boards and make recommendations, such as planning building sites, perhaps a building code, and other plans tending for the future development of the city. This will prevent the dividing up of tracts of land into building lots in haphazard style, with no regulations.

STREET CLEANING AND REFUSE DISPOSAL

New Street Cleaning Plans for New York.

New York, N. Y.—Street Cleaning Commissioner Fetherston has requested the Board of Estimate to appropriate \$250,000 to carry out a street cleaning experiment in a certain district of the city. Up-to-date appliances are to be used, and if the experiment proves successful the plan will be extended. Commissioner Featherston's plan is to have traction engines replace the ordinary horse-drawn vehicles in the collection of garbage, ashes, and the removal of snow. The garbage carts are to be covered, and covered cans will be furnished to householders free of charge. There will also be a new system of street flushing.

Refuse Hauling in Columbus.

Columbus, O.—The city will soon start refuse collection again. Under the action of public sentiment, the opposition in council disappeared sufficiently to allow the emergency appropriation measure for \$50,000 for this purpose to pass. Mayor Karb made an appeal for the passage of the ordinance.

Buys New Flusher.

Oswego, N. Y.—Commissioner of Works C. W. Linsley, has purchased from the Studebaker Company a pressure power street flusher. The flusher will be used on brick and asphalt pavements twice a week and will do away with much cleaning expense in addition to keeping the street cleaner and more sanitary. The flusher will cost over \$1,000 but the commissioner believes it will pay for itself in a short time.

RAPID TRANSIT

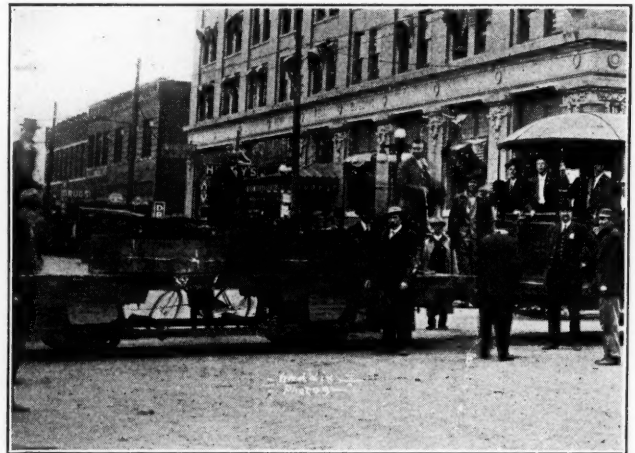
Free Rides in Toledo Car War.

Toledo, O.—Truce in the street railway franchise fight has been effected. Henry L. Doherty, head of the Toledo Railways and Light Company had announced that beginning the next morning the company would insist on collection of five cents cash fare and sell six tickets for 25 cents, except two hours each morning and evening when three-cent tickets would be accepted. The franchises expired March 27, when a city ordinance requiring three-cent fare at all hours became effective. The company refused to operate under it and has since permitted all who refused to pay more than three cents to ride free. Loss to the company has been \$1,000 a day. Twenty per cent of the car riders refused to pay the fare demanded by the company and rode free. City officials anticipated that many car riders would refuse to pay more than three-cent fares, and that rioting would result. An order was issued by the safety director to place a patrolman on each car. Fifty business men, insisting that the facilities of the city and business interests would be paralyzed by the anticipated rioting, conferred with Doherty and Mayor Keller. The result was that Doherty rescinded his order for collection of higher fare, upon condition that franchise negotiations be resumed immediately and that leadership in the negotiations be taken out of the hands of the City Solicitor.

City-Owned Transit Systems for Philadelphia.

Philadelphia, Pa.—Under the plan for additional rapid transit facilities, as agreed upon in all except wording, the subway and elevated lines projected in Philadelphia will be built by the city and be a municipally-owned system. These lines will cost, as estimated, about \$45,000,000. They will be leased to the Rapid Transit Company for fifty years, the necessary car and electrical equipment to be provided by the company at an estimated cost of \$12,000,000. It is estimated that the new river tunnel system proposed will cost \$6,000,000. The Rapid Transit Company will lease it at a rental which will cover interest charges on bonds issued to finance construction and will also probably get stock control of the Philadelphia-Camden tunnels company. The proposed construction and equipment of new rapid transit lines at an investment of \$63,000,000. The

Rapid Transit Company goes into the arrangement with the city with preferences to the net earnings of the new system. In effect, the \$45,000,000 investment by the municipality stands to underwrite the \$12,000,000 actual investment by the company and the obligation it assumes on account of the separate \$6,000,000 investment in the Camden tunnels. Under the arrangement the net earnings of the municipal system go first to the Rapid Transit Company to that extent necessary to meet the interest charge upon the \$12,000,000 capital investment which it will make. The Rapid Transit Company gets a call on the remaining net earnings of such system for the amount which may be required to reimburse it for whatever loss in net operating earnings shall result from diversion of traffic from the company's system to the new subway and elevated lines. Until these preferences to the Rapid Transit Company are satisfied, the city gets nothing for its \$45,000,000 investment. It has third call on the net earnings of the municipal system for interest and sinking fund charges on its capital investment. Beyond that, the earnings divide between the company and the city on the basis of their respective investments. On its part the Rapid Transit Company will make free transfer of passengers between its present sys-



Courtesy Dallas (Tex.) News.

TROLLEYLESS STREET CAR.

tem and the new municipal system. It also undertakes to gradually give up exchange tickets, from which it derived a revenue of \$794,000 last year, and which it estimates will be about \$900,000 by the time the new system is ready for operation. Under the proposed lease, one condition would be that transfer shall replace exchange tickets, until in the sixth year there would be universal free transfers, providing a through ride from any part of the city to any other part for 5 cents. Such operating economies as accrue to the Rapid Transit Company in consequence of division of traffic to the municipal system are to be credited to the city as an offset to the claim against earnings for losses on account of such change over of traffic. If there is dispute as to figures, arbitration is provided for.

A New Trolleyless Street Car.

Wichita Falls, Tex.—A street car, propelled by electricity derived, not from the trolley nor from a storage battery, but from a primary cell, has gone twelve miles through the business streets of Wichita Falls, through the residence section and out to Lake Wichita. The primary cell is the invention of Julius J. Krohn, a chemist of this city. In the illustration the chemicals are stored in the two boxes on the flat car, and these boxes are connected with a motor underneath the trailer, loaned by the Traction Company. That he can actually move a street car with his invention has been demonstrated to the entire satisfaction of a large number of Wichitans. His generating plant consisted of an eight-coil primary battery, which was placed on a flat-car and connected with the street car's motor with wires. The invention has not been patented, but application probably will be made.

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Bonds—Recital of Compliance with Vote—Effect.

Town of Harmon, Me., v. Truman.—A recital by the selectmen of a town, in bonds issued by them in aid of a railroad that they were issued in conformity to a vote of the municipality which imposed precedent conditions, did not estop the town to deny that such conditions had been performed, unless the selectmen were vested with authority to determine the question of performance, nor unless the recital was such as would import compliance with the conditions in all substantial respects.—Circuit Court of Appeals, First Circuit, 212 F. R. 4.

Street Improvements—Assessment Districts—Assessment of Benefits.

Hunt v. Manning, et al., Bd. of Supervisors, Los Angeles Co.—A statute which authorizes street improvements at the cost of property benefited within assessment districts need not, to be valid, specifically provide that in determining the boundaries of an assessment district only property which will be benefited can be included, but the power to specifically tax can only be exercised on the theory that benefits will accrue to the property assessed. Where the power to specially tax property benefited for the cost of a street improvement is conferred on public officers, the presumption of good faith on their part in levying the tax will be indulged in, and the court will assume that the officers properly considered and determined that all property within an established assessment district will receive benefits from the improvement.—District Court of Appeals, California, 140 P. R. 40.

Mandamus—Affidavit—Existence of Office.

State ex rel. Dwyer v. Duncan, Mayor of Butte.—In the absence of special demurrer, or motion to make more specific, the existence of the office to which plaintiff seeks restoration is sufficiently stated by the allegation of the affidavits for the writ of mandamus that he was appointed to the office of lieutenant of police of the police department of the City of B., a permanent existing office, created under the rules and regulations of the department promulgated by the city council and under authority of the statute.—Supreme Court of Montana, 140 P. R. 95.

Street Improvements—Notice to Property Owners.

Village of Oak Park, Ill., v. Surgart et al.—Where the board of local improvements mailed notices of the public hearing on an ordinance for the improvement of certain streets to the persons who made the last payment of taxes on the property abutting the improvement as required by statute, it was immaterial that some of the property owners failed to receive the notices.—Supreme Court of Illinois, 104 N. E. R., 1033.

Notice of Injury—Construction of Pleading.

Hall v. City of Spokane (Wash.).—In an action for personal injuries against a city whose charter provided that claims for injury from its alleged negligence should be presented in writing within 30 days after injury, that if claimant was physically or mentally unable to so present it, it might be filed by some one in his behalf where the complaint alleged that within 30 days plaintiff duly presented her claim for damages, with a verification deposing that she was unable to sign it, an answer admitting the filing of the claim on the date alleged, and denying all other allegations, did not admit its legal presentation, or that plaintiff was physically unable to present it within the prescribed time.—Supreme Court of Washington, 140 P. R. 348.

Contracts—Notice for Bids—Construction—Injunction.

Shields v. City of Seattle (Wash.) et al.—A published notice for bids for the sale of fire apparatus to a city, giving notice that proposals would be received for furnishing "two (2) combination city service hook and ladder and chemical trucks, and one (1) 75-foot automatic aerial truck,

four-wheel motor-driven or tractor drawn, for the Seattle Fire Department in accordance with specifications now on file," required bids on all three pieces of apparatus, so that bids which did not include the aerial truck could be rejected. In an action by a taxpayer to enjoin a city from contracting for the purchase of fire apparatus upon the ground that the agreed price is greater than the lowest bid submitted, the burden was on plaintiff to show that the bid accepted was illegal as alleged.—Supreme Court of Washington, 140 P. R. 553.

Judgment—Debt—Bond to Release Lien.

Coleman & Krause v. City of New York, et al.—Where a contractor for the erection of a municipal building, after a lien was filed, executed a bond to discharge the lien, the judgment of foreclosure should run only against the contractor and his surety, and not against the city and its officers.—Supreme Court, Appellate Division, First Dept. 147 N. Y. S. 294.

Public Lighting Systems—Tax Rate—Limitations.

Livermore v. Mayor, etc., of City of Millville (N. J.) et al.—The mere fact that the interest on bonds issued for a public lighting system and the costs of maintenance will so swell the city tax rate as to exceed the tax limit does not alone show that the tax limit will be exceeded, since a sufficient saving may be affected by the system and thereby offset the increase.—Court of Errors and Appeals of N. J., 90 A. R. 380.

Contracts for Public Work—Rights of Parties.

Caroline Nat. Bank of Columbia v. City of Greenville (S. C.) et al.—A contract for street paving, which stipulates that the contractor guarantees that for five years from the time of final payment he will keep the work in good repair and replace any defective material, does not permit the city, protected by a bond conditioned on the contractor performing the contract, to retain any part of the price to perfect the pavement and keep it in repair for five years from its completion.—Supreme Court of S. C., 81 S. E. R. 634.

Municipal Bonds—Preliminary Proceedings—Validity.

Perry v. Town of Panama (Fla.).—Municipal bonds can lawfully be issued only for municipal purposes; and, when a proposed issue of bonds appears to be for a "municipal purpose," the statute does not require the proceedings taken by the municipality or by the proper electorate preliminary to the issue of the bonds, to designate the particular municipal purpose for which they are intended to be used.—Supreme Court of Florida, 65 S. R. 6.

Defects in Streets—Partially Improved Streets.

Robinson v. Kansas City (Kan.) et al.—Where a strip in the center of a platted street had been cut down to the established grade, leaving the remainder thereof about six feet above the grade, the city extended no invitation to the public to use that portion which had not been graded, and therefore was not liable for injuries received by one who was coming down a path from the top of the bank to the graded portion of the street.—Kansas City Court of Appeals, 66 S. W. R. 343.

Street Improvements—Ordinances—Validity.

Gratz v. City of Kirkwood, (Mo.).—A provision, in a street improvement ordinance providing for plans and specifications, that a committee of the council may make alterations in the grade, plan, or dimensions of the work, either before or after its commencement, is invalid, because violative of the statute, as attempting to authorize changes after the adoption of plans and specifications and the giving of public notice of them, and after the letting of the contract.—St. Louis Court of Appeals, 166 S. W. R. 319.

Eminent Domain—Change of Grade—Original Construction.

Town of Erlanger (Ky.) v. Cody.—When a public highway is taken into a city, it becomes a street of the city; but the construction of a street upon it is not a reconstruction of a street, but an original construction.—Court of Appeals of Ky., 166 S. W. R. 202.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS.

Highway Improvement in Maryland Under Governor Goldsborough. Ill., 4 pp., Southern Good Roads, May. 10 cts.

A Picturesque Highway in North Carolina Highways. Subduing rocky nature. Interesting engineering in building a North Carolina Mountain Road. By A. S. Edmonds. Ill., 1 p., Manufacturers' Record, April 23. 10 cts.

The Highway Situation in Ontario. 3½ p., The Canadian Engineer. 10 cts.

A General Review of the Road Situation in West Virginia. Ill., 2½ pp., Southern Good Roads, May. 10 cts.

The Roads of Wood County, West Virginia. Ill., 1 p., Southern Good Roads, May. 10 cts.

West Virginia's Roads and First Needs. By A. D. Williams, Chief Engineer, West Virginia State Highway Commission. Ill., 2½ pp., Southern Good Roads, May. 10 cts.

Types of Maryland State Roads. Ill., 3 pp., Southern Good Roads, May. 10 cts.

Protection of New Pavements against Destruction by Trenching. Macon Ga. ½ p., Engineering News, April 30. 15 cts.

The Responsibility of Contractors for the Construction of Roads and Pavements Designed by Engineers. Lecture by H. Parker before graduate students of highway engineering at Columbia University. 2 pp., The Highway Contractor, May 1. 10 cts.

Planning Greater London. Proposed circular road. 1½ pp., Municipal Journal, London, May 22. 10 cts.

Road Maintenance Systems and Methods. By M. O. Eldridge, U. S. Office of Public Roads, 2 pp., Canadian Engineer, May 21. 10 cts.

Road Maintenance—Past and Present. Paper by A. MacArthur, before the Public and Local Government Officers' Ass'n of Sussex. 2 p., The Surveyor, London, May 6, 1914. 35 cts.

Method of Determining or Fixing Time for the Performance of City Contracts for Street Improvements. Paper before Municipal Engineers of New York. By G. L. Bennett. 5 pp., The Bulletin, March. 10 cts.

System of Road Building in Ontario. By W. A. McLean, Chief Engineer of Highways, Ontario, Canada. Ill., 1 p., The Canadian Municipal Journal, May, 1914. 10 cts.

How an English County is Handling Its Road Problem. Survey to Begin Asphalt Treatment with Its Own Forces. Ill., 1p., Engineering Record, May 30, 1914. 10 cts.

The Pennsylvania State Bureau of Township Highways. ½ p., Engineering News, May 28, 1914. 15 cts.

Street Department Organization and Methods. Oakland, Cal. Ill., 2½ pp., Engineering News, May 14, 1914. 15 cts.

Organization for and Methods and Costs of Constructing Concrete Roads in Milwaukee County, Wis., 1913. Ill., Charts and Tables. By A. J. Kuelling, County Highway Comr. 4 p., Engineering and Contracting, May 13, 1914. 10 cts.

Road Building Economics. By R. Trauttschold, M. E., Consulting Engineer, New York City. Tables, 5 pp., The Canadian Engineer, May 14, 1914. 10 cts.

Cost Keeping in County Road Work. 1 p., The Canadian Engineer, May 28. 10 cts.

Asphalt. The Progress of. Ed., ¼ p., The Contractor, June 1. 10 cts.

Fibred Asphalt Plant for Canada. ½ p., Canadian Engineer, May 21. 10 cts.

Renewing Asphalt Top Surface. Ill., ½ p., Municipal Journal, June 4. 10 cts.

Abandoning Guarantees on Asphalt Pavement. Ed., ¼ p., Engineering News, May 21. 15 cts.

Bituminous Roads and Economy. ¼ p., Municipal Journal, June 4. 10 cts.

Brick Pavements as an Investment. Address at National Brick Manufactur-

ers' Ass'n. By W. T. Blackburn, of Paris. Ill., 1 p., Manufacturers' Record, April 23. 10 cts.

Experience With Bituminous Pavements. Charlotte, N. C. By S. H. Lea, City Engineer. Ill., 2½ pp., Engineering News, May 28, 1914. 15 cts.

Tests of Hill Cut and Repressed Paving Blocks. Performances of Small Slabs Used in New York Highway Department; Experiment Favorable to First Type. Ill., ¾ p., Engineering Record, May 30, 1914. 10 cts.

Building Eighteen Miles of Brick Pavements at Ottawa. Ill., 3½ pp., The Contractor, May 15. 10 cts.

Economy in Brick Paved Roads. Paper by W. P. Blair, before First Canadian and International Good Roads Congress. Ill., 4½ pp., Brick and Clay Record, June 2. 20 cts.

Refractory Brick. Their manufacture, properties and definition. By T. E. Montgomery, Asst. Prof. of Ceramics, N. Y. State School of Clayworking and Ceramics. Ill., 5 pp., Brick and Clay Record, May 5. 25 cts.

Concrete Roads. Ill., 2 pp., The Highway Contractor, May 1. 10 cts.

The Testing of Aggregate in Concrete Road Construction. Ed., ¾ p., Engineering and Contracting, May 27, 1914. 10 cts.

Methods Used in Laying Concrete Sidewalks in Detroit. By D. J. Hauer. Ill., 2 pp., The Contractor, June 1. 10 cts.

Concrete County Roads. Ill., 1½ pp., The Highway Contractor, May 1. 10 cts.

Concrete Highways. 2 pp., The Highway Contractor, May 1. 10 cts.

A Concrete Road with Bituminous Surface in Seneca County. By J. M. Fitzwater. Ill., 2½ pp., The Highway Contractor, May 1, 1914. 10 cts.

Concrete Road Construction by the Ohio State Highway Department. Paper at the National Conference on Concrete Road Building. By H. D. Bruning, Division Engineer, Ohio State Highway Department. 5 pp., Concrete-Cement Age, May, 1914. 15 cts.

Earth Road Construction. Paper by J. G. Robertson, Provincial Engineer of Highways for Alberta before the Alberta Association of Local Improvement Districts. 1¼ pp., Canadian Engineer, May 21. 10 cts.

Estimating the Cost of Earth Work and Concrete Construction. By L. B. Merriam, M. Can. Soc. C. E. 6½ pp., Contract Record, June 3. 15 cts.

Macadam Construction for Towns. By D. T. Black, C. E. Ill., 1 p., The Canadian Municipal Journal, May, 1914. 10 cts.

Sand Clay Roads. Ed., ¼ p., Municipal Journal, June 4. 10 cts.

Sand Clay Roads. Conclusions from an examination of twenty-five hundred miles of such roads in Georgia; selecting materials; methods of construction. Abs. of paper before the American Society of Civil Engineers. By J. C. Koch. 2 pp., Municipal Journal, June 4. 10 cts.

Wood Block Paving in Louisville. Experience of five years; bleeding due to heavy filler, not experienced with light filler; cause of heaving. By D. R. Lyman. ¾ p., Municipal Journal, June 4. 10 cts.

Milwaukee Creosoted Block Pavements. Reason for changing from sand cushion on streets carrying car tracks; annual hot oil treatment; bulging; maximum grade. By F. W. Blodgett. Ill., 1¼ pp., Municipal Journal, June 4. 10 cts.

Laying a Wood-Block Pavement with Cement-Grout Filler. Cambridge, Mass. By L. M. Hastings. Ill., 1¼ pp., Engineering News, May 21. 15 cts.

Guarding against Expansion in Wood Block Paving. Ed., ½ p., Engineering News, May 14, 1914. 15 cts.

Bulletins. Highway Department. Ed., ¼ p., Engineering Record, May 16, 1914. 10 cts.

Milwaukee Ave. Viaduct. Chicago. 4 pp., Engineering News, May 28, 1914. 15 cts.

Proper Care of Road Machinery. Ill., ¾ p., Engineering News, May 28, 1914. 15 cts.

Road-Making Tractor Truck a Universal Vehicle. Five-ton White product draws implements, rolls road and carries earth. Ill., 12 pp., Commercial Vehicle, June 1. 20 cts.

Improved Asphalt Penetrometer. Ill., 1 p., Engineering Record, May 23, 1914. 10 cts.

The County Court and its Highway Problems. By Henry L. Bowlby. Ill., 1 p., Pacific Builder and Engineer, May 9, 1914. 10 cts.

Sprinkling Street Railway. Legal decisions as to authority of municipalities to compel street railway companies to sprinkle their right of way. By J. Simpson. 2 pp., Municipal Journal, May 14. 10 cts.

Additional Highway Data. Roads in Ohio and New Mexico, and sums spent by each state on highways last year; New Mexico highway conditions. 1 p., Municipal Journal, June 4. 10 cts.

Filler. Bituminous, and Dry Mortar Bed in Creosoted Wood Block Pavement Construction. 2 pp., Engineering and Contractor, May 27, 1914. 10 cts.

SEWERS AND SANITATION.

Sewerage System. The Weston, Ont. ½ p., Contract Record, May 20. 15 cts.

Report on a Sewerage Plan for Cincinnati. 2½ pp., Engineering News, May 28, 1914. 15 cts.

Preliminary Report on Sanitary Policy of Chicago. ½ p., Engineering Record, May 23, 1914. 10 cts.

Report of Chicago Sewage Disposal and Water-Supply Problems. 1 p., Engineering News, May 14, 1914. 15 cts.

Chicago's Sanitary Policy. Board of experts make general recommendations as to city's sewerage and water supply. 1½ pp., Municipal Journal, May 21. 10 cts.

Experts Report on Chicago's Sewerage. Ed., ½ p., Municipal Journal, May 21. 10 cts.

Flies. Exterminating, in Cleveland. Methods employed in making Cleveland almost absolutely a flyless city; organized and enthusiastic children the principal agents. By R. M. Winans. Ill., 1¼ pp., Municipal Journal, May 21. 10 cts.

Sanitary Engineering Innovations at Cleveland. ½ p., Ed., Engineering Record, June 6, 1914. 10 cts.

Sewer. Constructing a Deep Concrete, in Milwaukee. 1 p., The Contractor, June 1. 10 cts.

The Mt. Elliott Avenue Trunk Sewer. Detroit, Mich. Ill., 3 pp., Engineering News, May 14, 1914. 15 cts.

Building a Reinforced-Concrete Outfall Sewer Limited by Tides and Clearance at Vancouver. B. C. Ill., 1½ pp., Engineering Record, May 30, 1914. 10 cts.

Sewage Disposal in Philadelphia. Work done by the Holmesburg or Pennypack Creek plant during 1913; some European disposal plants briefly described. 2 pp., Municipal Journal, May 21. 10 cts.

Sewage Disposal Plants. Ed., 1-6 pp., Engineering and Contracting, May 27, 1914. 10 cts.

The Operation of Sewage Disposal Plants. Sprinkling filters; final settling basins; sand filters; distribution of sewage over the beds; keeping the surface in condition; operating sand filters in winter; under-drainage and ventilation. By Francis E. Daniels. Ill., 3¼ pp., Municipal Journal, May 21. 10 cts.

Manchester Corporation Sewage Works. Withington. Installation of Emscher tanks. Ill., 2 pp., The Surveyor, May 29, 1914. 40 cts.

Pumping Plant. General Design of Drainage, South Quincy Drainage and Levee District, Illinois. Ill., 2 pp., Engineering and Contracting, May 27, 1914. 10 cts.

Sewage Treatment Works at Rochester, N. Y. Ill., 1 p., Engineering News, June 4, 15 cts.

Tests of Electrolysis of Sewage at Toronto. By I. H. Nevitt, Asst. Sewer Engineer. Ill., 1½ pp., Engineering News, May 14, 1914. 15 cts.

Experiments on the Oxidation of Sewage at Columbus, Ohio. By C. B. Hoover, Chemist in Charge, and C. D. Maguire, Asst. Chemist. 3¼ pp., Engineering News, May 28, 1914. 15 cts.

Sewage Pollution of Boundary Waters. Abs. of paper before American Water Works Assn. By Allen J. McLaughlin, Surgeon, U. S. Public Health Service. ¼ p., Municipal Journal, May 28. 10 cts.

State Control of a Water Pollution in Illinois. By T. J. Healy, Member of the Rivers and Lakes Commission of Illinois. ½ p., Engineering News, May 21. 15 cts.

Sewerage Statistics of the Boston Society of Civil Engineers. ½ p., Municipal Journal, May 21. 10 cts.

Sewer Maintenance in New York. Sewer and basin cleaning and repair; obtaining unit costs; amount of dirt and other objects removed and cost of removal. 1 p., Municipal Journal, May 21. 10 cts.

Apparatus for Taking Samples in Sewage Tanks. Simple home-made but effective contrivance for expediting this work. By F. E. Daniels. Ill., 1 p., Municipal Journal, May 21. 10 cts.

The Manufacture of Sewer Pipe. Part IV—Burning. 2 pp., The Clay Worker, May, 1914. 25 cts.

Kansas City Specifications for Sewer Pipe, and Experience in Testing Sewer Pipe. By E. S. Wallace, Cement Inspector, Kansas City, Mo. Ill. and table. 2 1-16 pp., Engineering News, April 30. 15 cts.

Sewage Collection and Treatment in Philadelphia. Paper by G. S. Webster, Chief Engineer, before the sanitary section of the Boston Society of Civil Engineers. 3¼ pp., Canadian Engineer, May 21. 10 cts.

Tile Drainage. The Permanency of. By C. G. Elliott, Consulting Drainage Engineer. Ill., 2¼ pp., The Clay Worker, May, 1914. 25 cts.

Sewer or Drain Ed. ¼ p., The Surveyor, May 29, 1914. 40 cts.

WATER SUPPLY.

Water Works, of Bridgeton, N. J. Ill., 6 pp., Municipal Engineering, June, 1914. 25 cts.

Proposed Works for the Additional Water Supply of Toronto, Ont. 3¼ pp., Engineering and Contracting, May 27, 1914. 10 cts.

Some Problems in the Design of Small Water Works System. Abs. of paper by W. S. Johnson, Sanitary and Hydraulic Engineer before the New England Water Works Assn. 3¼ pp., Engineering News, May 21. 15 cts.

Water Works from Fire and Insurance Standpoints. Continued from previous issue. By J. B. Rider, C. E. 1½ pp., Fire and Water Engineering, May 20. 10 cts.

The Philadelphia Water Works. Ill., 2½ pp., Fire and Water Engineering, May 6, 1914. 10 cts.

Greater New York Water Supply Scheme. Paper before Institute of Municipal Engineers. By W. T. Taylor, F. R. G. S. Ill., 9½ pp., The Surveyor, May 15. 40 cts.

Experts Preliminary Report on the Future Water Supply and Sewage Disposal Policy of Chicago. Curves, 3 pp., Engineering and Contracting, May 13, 1914. 10 cts.

Old and New Methods in Water Works Practice. 1 p., Fire and Water Engineering, May 6. 10 cts.

Intake Tunnel. Driving the Water, at St. Louis. By E. C. Davis, Asst. Engr. Water Department, St. Louis, Mo. Ill. and tables, 3¼ pp., Engineering News, May 14, 1914. 15 cts.

Reservoir Storage. By W. P. Mason, Prof. of Chemistry, Rensselaer Polytechnic Institute. 4¼ pp., Canadian Engineer, May 21. 10 cts.

Distribution. The Dual System of. Abs. of paper before American Water Works Assn. By H. C. Hodgkins. ¼ p., Municipal Journal, May 28. 10 cts.

Cost of Obtaining Water from Wells at Owensboro, Ky. 1¼ pp., Engineering and Contracting, May 13, 1914. 10 cts. Result of Boston Tests and Studies of High Pressures, Cast Iron Bell and Spigot Joints and of Jointing Materials, Curves and Tables. 2½ pp., Engineering and Contracting, May 13, 1914. 10 cts.

Unwatering Equipment for Pressure Tunnels of the Catskill Aqueduct. By H. Carpenter, Mechanical and Electrical Engineer. Ill., 3¼ pp., Engineering News, June 4. 15 cts.

Water Purification Methods. Ed., ½ p., Municipal Journal, May 28. 10 cts.

Purification of Water by Ultra-Violet

Rays. ½ p., Contract Record, June 3. 15 cts.

Water Purification at Cleveland. Two plants with combined capacity of 225,000,000 gallons daily, making largest mechanical-filter system in existence. Ill., 1½ pp., Engineering Record, June 6, 1914. 10 cts.

Disinfecting Philadelphia's Water Supply. Experience with chlorine of lime and liquid chlorine at Torresdale filtration plant, treating two hundred million gallons a day. Paper before American Water Works Association. By Francis D. West, Chemist in Charge, Torresdale Laboratory, Philadelphia. Ill., 8¼ pp., Municipal Journal, May 28. 10 cts.

Filtration Plants in the United States and Canada. Table giving list of plants and capacity. 1 p., Fire and Water Engineering, May 6, 1914. 10 cts.

Remarkable Advance in America of Mechanical Filtration. 1 p., Fire and Water Engineering, May 6, 1914. 10 cts.

Present Day Water Filtration Practice. Abs. of paper before American Water Works Assn. By G. A. Johnson. 2¼ pp., Municipal Journal, May 28. 10 cts.

Ridge Block Construction in Filter at Evanston, Ill. Ill., 1 p., Engineering Record, May 23, 1914. 10 cts.

Meterage, Filtration and Pumping Statistics. 1½ pp., Fire and Water Engineering, May 6, 1914. 10 cts.

The Progress on Meterage. ½ p., Fire and Water Engineering, May 6, 1914. 10 cts.

Do Meters Over-Register? Ed., ¼ p., Municipal Journal, May 28. 10 cts.

Statistics. The Faulty Nature of, American Water Consumption. Ed., ½ p., Engineering and Contracting, May 27, 1914. 10 cts.

Some Engineering Problems Connected with the Maintenance of Water Supply Conduit. By R. G. Hosea. Ill., 2½ pp., Engineering and Contracting, May 20, 1914. 10 cts.

Bacterial Counts in Water Analysis. Investigation into Advisability of Substituting Agar for Gelatin as a Medium for Determination of. Abs. of paper before American Water Works Assn. ½ p., Municipal Journal, May 28. 10 cts.

Algae, On the Excessive Growth of, in Water, and the Remedy. By T. Johnson, D. Sc., F. L. S., Professor Botany, Royal College of Science, Dublin. 3 pp., Water and Water Engineering, May 15. 10 cts.

Some Observations on the Effect of Ozone on Algae Growths. Abs. of paper before American Water Works Assn. By S. T. Powell. ½ p., Municipal Journal, May 28. 10 cts.

Check Valves. Testing. Abs. of paper before American Water Works Assn. By J. W. Ackerman. ¼ p., Municipal Journal, May 28. 10 cts.

Installation and Testing of Double Check Valves Between Public Polluted and Industrial Water Supplies, at Auburn, N. Y. Ill., 1 p., Engineering and Contracting, May 20, 1914. 10 cts.

Locating Leaks in Water Mains. By M. L. Enger, Asst. Prof. of Theoretical and Applied Mechanics, University of Illinois. Ill., 1¼ pp., Fire and Water Engineering, May 6, 1914. 10 cts.

Stopping Leaks in the Absorption Plant. What to use to test water for ice making to determine the presence of objectionable impurities. By W. S. Luckenbach. Ill., 1 p., Power, May 19. 5 cts.

A Booster Pump at Malone, N. Y. for Increasing Water Works, Supply Line Capacity. Ill., 1¼ pp., Engineering News, May 21. 15 cts.

Description of an Air Lift Pumping Plant at Limsfield. 6¼ pp., Water and Water Engineering, May 15. 10 cts.

Hydrant Rentals. A Discussion on Equitable, and Better Methods of Apportioning Fire Protection Costs. Tables. 1½ pp., Engineering and Contracting, May 20, 1914. 10 cts.

Pressure Recording Gauges. The Use and Benefit of, in Water Works Operation. Curves, Engineering and Contracting, May 20, 1914. 10 cts.

Condition of the Interior of a 48-Inch Riveted-Steel Water Main after Seventeen Years' Service. Abs. of report before Water Board of New Bedford. Ill., 2 pp., Engineering News, June 4. 15 cts.

Standard Specifications for Water Works Hydrants. Ed., ¾ p., Engineering News, April 30. 15 cts.

Siphon. San Fernando Inverted, Los Angeles Water Supply. By B. A. Heinly, Department Public Service. Ill., 5¼ pp., Engineering News, May 21. 15 cts.

The Narrow Siphon of the Catskill Aqueduct. Ill., 2½ pp., Engineering News, April 30. 15 cts.

Dam. The Lost River Multiple-Arch Curved. By W. W. Patch, Consulting Engineer, Klamath Falls, Ore. Ill., 6¼ pp., Engineering News, April 30. 15 cts.

Reinforced Concrete Storage Dam at

Swift Current, Sask. By W. F. Farley, Asst. Engr. Ill., 2½ pp., The Contract Record, May 27. 15 cts.

Preliminary Investigations, Construction, Sluicing and Core Sampling at the Somerset Dam. Ill., 5½ pp., Engineering News, June 4. 15 cts.

Some Movable Dam Crests. By W. L. Marshall, Brigadier General, U. S. Corps Engineers. Ill., 2¼ pp., Engineering News, June 4. 15 cts.

Masonry Construction Work at the Kensico Dam in 1913. By W. F. Smith, Division Engineer. Ill., 6½ pp., Engineering News, May 21. 1914. 15 cts.

STREET LIGHTING AND POWER PLANTS.

On Street Lighting. Paper by F. Victor Westermaler, before Illinois Gas Assn. Ill. and curves, 5 pp., The American Gas Light Journal, May 4, 1914. 10 cts.

Progress of the Science of Lighting. Lecture by E. P. Hyde. 1½ pp., The Gas Age, April 15. 10 cts.

Suburban Street Lighting. Van Neys Lighting District, California. Ill., 4 pp., Municipal Engineering, June, 1914. 25 cts.

Suburban Street Lighting, Lighting of North Shore Boulevard, Lynn to Swampscott, Mass. By G. N. Chamberlin, Engr. Arc Light Dept., General Electric Co. Ill., 3 pp., Municipal Engineering, June, 1914. 25 cts.

Lighting Protection. Ed., ¾ p., Electrical Review, May 2, 1914. 10 cts.

Reports of Test of Illumination on Pennsylvania Avenue, Washington, D. C. Electrical Engineer of the District of Columbia. 1 Chart and two tables. 1¼ pp., General Electric Review, May, 1914. 20 cts.

Some Present Street Lighting Problems. By J. R. Cravath. 1¼ pp., Electrical World, May 9. 10 cts.

Electric Power: Its Sources and their Permanency. By F. M. Kimball, Mgr., Small Motor Dept., General Electric Co. 2½ pp., General Electric Review, June, 1914. 20 cts.

The Distribution of heat in the operation of steam boilers. By Perry Barker. Paper at the Boston meeting of the American Institute Chemical Engineers. 2½ pp., American Gas Light Journal, May 18, 1914. 10 cts.

Detecting Faults. Method of, in Transmission Insulations. By T. A. Worcester, Power and Mining Engineering Dept., General Electric Co. 2¼ pp., General Electric Review, June, 1914. 20 cts.

Health Value Lighting and Heating. By Prof. V. B. Lewes, Royal Naval College, England. 2 pp., The Gas Age, May 1, 1914. 10 cts.

Switchboard Signal Equipment for Power Stations. By E. Bern, Switchboard Engineering Dept., General Electric Co. Ill., 2 pp., General Electric Review, June, 1914. 20 cts.

Electric Traction. The Development of. By John R. Hewett. 6¼ pp., General Electric Review, May, 1914. 20 cts.

Electrolysis Prevented by Return Feeders. Report of a commission of experts upon electrolytic conditions at Springfield, Ohio. Ill., 3¼ pp., The Gas Age, May 15. 10 cts.

Wiring Methods Inexpensive. Followed in Europe. Ill., 4 pp., Electrical World, June 2. 20 cts.

Hydro-Electric Power Plants. Excitation of. By R. E. Argersinger, Power and Mining Dept., General Electric Co. Ill., 5½ pp., General Electric Review, June, 1914. 20 cts.

Ventilation of Hydro-Electric Power Stations. By R. C. Muir, Power and Mining Engineering Dept., General Electric Co. 3½ pp., Ill., General Electric Review, June, 1914. 20 cts.

Structural Features and Construction Methods of Hydro-Electric Plant at Elkhart, Ind. By W. G. Fargo and L. B. Andrus. Ill., 3 pp., Engineering and Contracting, May 20, 1914. 10 cts.

Recording Devices. By Charles P. Steinmetz, Chief Consulting Engineer, General Electric Co. Ill., 4 pp., General Electric Review, May, 1914. 20 cts.

An Investigation of the Use and Rating of the Current Meter. By Chas. R. Rumpf. Ill., 1¾ pp., Engineering News, May 14, 1914. 15 cts.

A Combined Recording Electric-Energy and Maximum-Demand Meter. Ill., ½ p., Engineering News, June 4. 15 cts.

Unit Prices. The Determination of, of Material for Purposes of Valuation of Plant. Curves and Tables. 2 pp., Engineering and Contracting, May 13, 1914. 10 cts.

High-Tension Cables. Installation of Six, in the Ohio River at Pittsburgh, Ill. 2¼ pp., Engineering News, April 30. 15 cts.

Calorific Value of Expressing the

True Quality of Gas and Conditions Governing Its Supply. Paper by J. B. Klumpp, Secy Public Relations Committee, for the Indiana Gas Assn. American Gas Light Journal, April 6, 1914. 10 cts.

Removing Carbon from Gas Engines. Paper before the National Gas Engine Assn. by J. A. Angala. 1/2 p., American Gas Light Journal, May 18, 1914. 10 cts.

Draft Lost through Boilers. By O. Monnett, Smoke Inspector, Chicago. Ill. 2 1/2 pp., Power, June 2. 5 cts.

Heat Losses in Boiler Practice. Excess air, furnace settings, combustion rates, firebrick and the purchase of coal under specifications. By C. H. Bromley-Power. 3 pp., Engineering Magazine, June. 25 cts.

A Comparison of Boiler Standards. Ed., 3/4 pp., Power, May 19. 5 cts.

A Comparison of Boiler Standards. By J. W. F. MacDonald. 3 3/4 pp., Power, May 19. 5 cts.

Equitable Gas Rates. Paper before Southern Gas Assn. By S. E. De Frese. 2 1/2 pp., The Gas Age, May 15. 10 cts.

Connecting Series and Shunt Motors. By F. A. Annett. Ill., 3 pp., Power, June 2. 5 cts.

The Standard for Gas Tests. Important parliamentary decision. 1 1/4 pp., Municipal Journal, London, May 8. 5 cts.

FIRE AND POLICE.

Beautiful Forest. How the, of New York State Are Protected from Fires. By G. E. Van Kernen, Chairman of the Conservation Commission. Ill., 3 pp., Fire Prevention, May, 1914. 25 cts.

Two Platoon. History of the, 1/2 p., The Fireman's Herald, May 16, 1914. 10 cts.

Sliding Pole. The Fire Station. History of the origin and adoption of the most popular addition to fire department equipment ever devised. Ill., 1 p., Fire and Water Engineering, May 6. 10 cts.

Motor Apparatus Specifications. Ed., 1/2 p., Fireman's Herald, May 30. 5 cts.

Hand-Drawn Chemical Fire Engines. By Henry Butterfield. 3 pp., Safety Engineering, May. 25 cts.

Incendiary. The Professional. Ed., 1/2 p., The Fireman's Herald, May 16, 1914. 10 cts.

GOVERNMENT FINANCE.

Town Exhibit in Westfield. Curves. 1 p., Municipal Journal, June 4. 10 cts.

The City Manager Plan. How it operates in Dayton, Ohio, the largest city which has tried it. Advantages claimed for it. Paper before Fifth Annual Conference of Mayors of New York State. By H. M. Waite, City Manager of Dayton. 2 pp., Municipal Journal, June 4. 10 cts.

The Home Rule Bill. A discussion of the Hennessy Amendment; its Effect on commission-governed cities. By T. W. Shimpf, City Solicitor. 2 1/2 pp., Atlantic City Commission Government, April, 1914. 10 cts.

Commission-Manager Plan of Government. Ed., 1/4 p., Municipal Journal, June 4. 10 cts.

REFUSE DISPOSAL AND STREET CLEANING.

Motor Trucks for Refuse Collection in New York City. Ill., 1/4 p., Engineering News, May 14, 1914. 15 cts.

Refuse Can and Incinerator. German. More details concerning system used in Furth, Bavaria. Pail and wagon for sanitary collection. German refuse destructor. Ill., 1 1/4 pp., Municipal Journal, May 14. 10 cts.

New Incinerating Plant at Regina, Sask. Ill., 3 1/2 pp., The Canadian Engineer, May 14, 1914. 10 cts.

Different Styles of Incinerators. Ed., 1/2 p., Municipal Journal, May 14. 10 cts.

Refuse Disposal in Regina. One hundred and ten ton plant for city refuse, including large amount of manure. Steam boilers of two hundred horse power. Refuse hauled by street railway from loading station. Ill., 3 1/2 pp., Municipal Journal, May 14. 10 cts.

Chicago Refuse Disposal. Reports of experts; comparison of six projects; refuse collection; incineration plants; reduction methods; paper burners. 2 3/4 pp., Municipal Journal, May 14. 10 cts.

Sorting and Utilization. Municipal Refuse Plant, Pittsburgh, Pa. By S. H. Bunnell, Ch. Eng. Ill., 4 1/2 pp., Engineering News, April 30. 15 cts.

Refuse Removal. Ed., 3/4 p., The Surveyor, May 29, 1914. 40 cts.

Fire Hazard from Incinerators. 1/4 p., Municipal Journal, May 14. 10 cts.

Unit Costs of Street Cleaning. Plan worked out by New York's Commissioner of Accounts. Actual figures ob-

tained by five months' use in department. 3 1/4 pp., Municipal Journal, May 14. 10 cts.

Unit Costs of Street Cleaning. Ed., 1/4 p., Municipal Journal, May 14. 10 cts.

Handling Snow. Methods of, in Boston, Mass. Ill., 1 1/2 pp., Engineering and Contracting, May 13, 1914. 10 cts.

TRAFFIC AND TRANSPORTATION.

Motor Cars. Chicago Builds. By W. Webb. Ill., 2 pp., Municipal Engineering, June, 1914. 25 cts.

German Motor Trucks and Trailers. Ill., 3 1/2 pp., Municipal Engineering, June, 1914. 25 cts.

How to Determine Type of Motor. Directions for determining by means of leads whether a direct current motor is shunt, series or compound wound. By F. A. Annett. Ill., 2 1/2 pp., Power, May 19. 5 cts.

Skidding Vehicles and Street Pavements. Chamber, Wheel diameter, Driv- ing. 2 pp., The Surveyor, London, May 8, 1914. 35 cts.

STRUCTURES AND MATERIALS.

Contlevator Canopies for Platform Shelters on the Chicago Elevated Railways. Ill., 1 1/2 pp., Engineering News, April 30. 15 cts.

Recording the Underground Structures in Los Angeles. Cal. 3/4 p., Engineering News, June 4. 15 cts.

Patents Relating to Concrete Construction. By Water M. Denman, 2 pp., Cement and Engineering News, March, 1914. 10 cts.

Diagrammatic Method of Determining Cost per Foot of Cast Iron Pipe. Abs. of paper before American Water Works Assn. By W. E. Miller. 1/2 pp., Municipal Journal, May 28. 10 cts.

Steel Pipe Conduit at Loch Raven. By E. B. Whitman. 2 1/2 pp., Monthly Journal of the Engineers Club of Baltimore, June. 10 cts.

Laying, Unusual Methods of, an 8-in. Wrought-Iron Sub-Marine Pipe Line. By T. H. Vaughan, Chief Construction Engr. Ill., 2 p., Engineering News, May 14, 1914. 15 cts.

Vents on Steel Pipe Lines. By M. L. Enger and B. F. Seely, University of Illinois. Ill., 2 pp., Engineering Record, May 23, 1914. 10 cts.

Bridge. Design of the Superstructure of the New Quebec. By H. P. Borden, Asst. to Chief Engineer, Quebec Bridge. Ill., 3 1/2 pp., Engineering News, April 30. 15 cts.

Rusting of Steel Bridges. Abs. of paper by C. Older, before Illinois Society of Engineers and Surveyors. Ill., 2 p., Engineering Record, June 6, 1914. 10 cts.

A Reinforced Concrete Truss Bridge, Las Vegas, N. M. By G. E. Morrison, Civil Engr. Ill., 2 pp., Engineering News, June 4. 15 cts.

Reinforcing the Williamsburg Bridge under Traffic. Ill., 1/4 p., Engineering News, May 14, 1914. 15 cts.

The Mayo Bridge, Richmond, Va. A Reinforced-Concrete Municipal Bridge. By C. E. Bolling, City Engr. Ill., 3 3/4 pp., Engineering News, May 14, 1914. 15 cts.

Private Bridges over Public Street. Erection of bridges and passageways by private corporations over public highways; regulations in several cities. By A. L. Bostwick. 1 1/2 pp., Municipal Journal, June 4. 10 cts.

Concrete and Its Manifold Uses. Ill., 1 1/2 pp., The Highway Contractor, May 1, 1914. 10 cts.

Proportioning Concrete. Ed., 1/4 p., The Surveyor, May 22. 40 cts.

Sand and Coarse Material and Proportioning Concrete. Summary of paper by J. A. Davenport and S. W. Ferrott, before Concrete Institute. 3/4 p., The Surveyor, May 22. 40 cts.

Practical Considerations in Concrete Arch Design. By E. G. Kaufmann. 5 1/2 pp., Contract Record, May 20. 15 cts.

Proportioning Gravel Concrete. Quantity and Cost Curves. 3 pp., Engineering and Contracting, May 27, 1914. 10 cts.

Some Facts on Reinforced Concrete. By H. O. Hoffmann, Civil Engineer, Montreal. Ill., 2 1/2 pp., Canadian Engineer, May 21. 10 cts.

Reinforced Concrete Construction. Aberdeen Water Works. Ill., 2 1/2 pp., Water and Water Engineering, May 15. 10 cts.

Motor-Making Qualities. Results of Tests to Determine the, and Characteristics of Illinois Sands. Tables. 4 pp., Engineering and Contracting, May 27, 1914. 10 cts.

German Slag. Uses of. 1/2 p., The American Contractor, May 16. 10 cts.

Belt Conveyors. The Use of, in Heavy Concrete Dam Construction. By J. A.

Bried. Ill., 3 pp., Concrete-Cement Age, May, 1914. 15 cts.

Track Elevation. How, Work is Done at Indianapolis. Description of plant used and suggestions for improving methods. By D. J. Hauer. Ill., 3 1/4 pp., The Contractor, May 15. 10 cts.

Tunnels. The East River, of the New Rapid Transit Lines in New York. Ill., 1 p., Engineering News, April 30. 15 cts.

MISCELLANEOUS.

Public Improvements. Baltimore's. By C. W. Hendrick, Chief Engr. Ill., 2 1/2 pp., Engineering Record, May 30, 1914. 10 cts.

Building Heights Restrictions. Proposed, in Minneapolis. 1/2 p., Engineering Record, May 30, 1914. 10 cts.

Floods. The December, in Texas. By B. Bunnemeyer, Section Director, Weather Bureau. Ill., 6 pp., Engineering News, May 21. 15 cts.

Handling of Men. Some Serious Abuses in the Employment and. 2 pp., The Contractor, June 1. 10 cts.

Quarrying with Prisoners in St. Louis. Broken stone for street department furnished by workhouse prisoners at municipal quarry; effort to secure efficient work from defectives by improvements in equipment; daily stints for hand drilling. By H. M. Crutcher. Ill., 2 pp., Municipal Journal, June 4. 10 cts.

Convict Labor in New Jersey. 1/4 p., Municipal Journal, June 4. 10 cts.

Street Naming. Geographical. 1/4 p., Municipal Journal, May 14. 10 cts.

Cost Figures. Getting More: A Two-Form Progress Report. Records which will be of both present and future value to the contractor who keeps them. By L. Bates, Jr. 2 forms. Ill., 2 pp., The Contractor, May 15. 10 cts.

Analysis of Trenching Methods and Costs. By R. T. Dana, Consulting Engr. Ill., 3 pp., Engineering Record, May 23, 1914. 10 cts.

Cooperative Standardization. By J. W. Ham, Power and Mining Dept., General Electric Co., 3 1/2 pp., General Electric Review, June, 1914. 20 cts.

Safety Organization. Efficient. Central committee with expert staff to work with employees. By H. A. Bullock. Ill., 16 pp., Area, May. 25 cts.

Survey Practice. Notes on, at Storm Lake, Ia., with an Accurate Method of Balancing Earthworks from Profile. By H. L. Browne, Asst. Eng. Ill., 3 pp., Engineering and Contracting, May 20, 1914. 10 cts.

Depreciation and How it is Applied. By C. H. Bromley. 1 p., Power, June 2. 5 cts.

A Dry-Land Mattress on the Mississippi. By F. Y. Parker, U. S. Asst. Engr., St. Louis. Ill., 1 p., Engineering News, June 4. 15 cts.

Permanent Levels. A Plea for, for Cities, Towns and Villages. Paper before the Ontario Land Surveyors' Assn. By A. M. Jackson, C. E. Ill., 3/4 p., The Municipal World, April, 1914. 10 cts.

The Relations of the State to Towns— Division of Work—Unjust Criticism Deplored. Paper by C. J. Bennett, Commissioner, Connecticut, before the Society of Engineers. 3 3/4 pp., The Highway Contractor, April 1. 10 cts.

Value of Filtered Oil. Curves and tables. 1 1/4 pp., Power, May 19. 5 cts.

A Traveling Tamping Machine for Earth Fills. Ill., 3/4 p., Engineering News, May 28, 1914. 15 cts.

Bank Slides. Handling Canal, in Chicago. Ill., 2 1/2 pp., Engineering Record, May 16, 1914. 10 cts.

Contractor. Engineers' Estimates as they Affect the. 2 3/4 pp., The Canadian Engineer, May 28. 10 cts.

Why are One-Sided Contracts the Rule With Contractors? 1 p., Engineering Contractor, April, 1914. 25 cts.

How to Handle Capital in Contracting to Advantage. 1 1/4 pp., The Contractor, May 15. 10 cts.

Supervising the Execution of Large Percentage Contracts to Protect the Clients' Interests. By G. G. Ommanney. 1 1/2 pp., Engineering News, April 30. 15 cts.

The Value of an Organization to the Contractor. Ed., 3/4 p., The Contractor, May 15. 10 cts.

The High Cost of Bidding. 1 p., Engineering Record, May 30, 1914. 10 cts.

Public Utilities. A Form for. Ed., 1/4 p., Electrical World, April 18. 10 cts.

Rate Making for Public Utilities. By Prof. W. G. Raymond, University of Iowa. 5 1/2 pp., Municipal Engineering, June, 1914. 25 cts.

Public Utilities Problem. Regulation, rate of return, character of franchises, municipal ownership, the fundamentals. By T. N. McCarter, President, Public Service Corporation of New Jersey. 15 pp., The Aera, May. 25 cts.

Handling the Small Consumer in Europe. Statistics from continental cities showing how electricity for domestic purposes is furnished to the poorest inhabitants. By S. E. Doane. Ill., 18 pp., Electrical World, May 23. 10 cts.

Reasonable Charge for Public Utility Service. Address by M. E. Cooley, Dean of the College of Engineering, University of Michigan, before Western Society of Engineers. 5 pp., The Gas Age, April 15. 10 cts.

Municipal Engineer's Relation to Society. Engineer's future as a public spirited citizen and the way to proper recognition. By H. Gerharz, City Engineer, Billings, Mont. 2 pp., Pacific Builder and Engineer, May 23. 15 cts.

Relation of Consulting Engineers to the Engineering Staff. $\frac{3}{4}$ p., Engineering News, April 30. 15 cts.

Technical Training for Highway Engineers. By A. T. Laing, B. A. Sc., Professor, Faculty Applied Science and Engineering, University of Toronto, 2 pp.,

The Canadian Engineer, May 28. 10 cts. Engineering and Accounting—Their Relation with Special Reference to Public Utilities. Paper before Utah Society of Engineers. By J. B. Scholefield. $3\frac{3}{4}$ pp., The Canadian Engineer, May 28. 10 cts.

Coal Efficiency. Showing the influence of the ash, moisture and hydrogen content of a coal upon its value as a steam producer. By H. O'Neill. Curves. $1\frac{1}{2}$ pp., Power, May 19. 5 cts. Burning Soft Coal without Smoke. Ed., $\frac{3}{4}$ p., Power, May 19. 5 cts.

The Bureau of Supplies.—How business-like methods and systematic buying is saving the city \$10,000 a year. Ill., 2 $\frac{1}{2}$ pp., Atlantic City Commission Government, April, 1914. 10 cts.

Seattle's Public Market. $\frac{1}{2}$ p., Municipal Journal, May 14. 10 cts.

Charities. The Organized. Results achieved by scientific treatment of an old age problem. $1\frac{1}{2}$ pp., Atlantic City

Commission Government, April, 1914. 10 cts.

Montreal's Refuge. By H. B. Hillwell. Ill., 1 p., Canadian Municipal Journal, April, 1914. 25 cts.

Pauperism, Prevention of. By Mrs. C. Hammer-Jackson. 1 p., The Canadian Municipal Journal, May, 1914. 10 cts.

City Planning, The Municipality and. By Guy W. Hayler, Member Institute of Municipal Engineers. $\frac{3}{4}$ p., The Canadian Municipal Journal, May, 1914. 10 cts.

Legal Rights in Trees. Cities' ownership of and jurisdiction over trees on public highways; rights of private owners; liability for damages. By C. O. Ormsbee. 1 p., Municipal Journal, June 4. 10 cts.

Parks, Playgrounds and the "City Beautiful"—The Good Work Being Done by Director Bacharach's Department. 3 pp., Atlantic City Commission Government, May. 10 cts.

NEWS OF THE SOCIETIES

Calendar of Meetings.

June 15-17.

AMERICAN SUPPLY AND MACHINERY MANUFACTURERS' ASSOCIATION.—Annual Convention, White Sulphur Springs, W. Va. T. D. Mitchell, Secretary, Woolworth Building, N. Y.

June 15-17.

SOUTHWESTERN WATER WORKS ASSOCIATION.—Third Annual Convention, New Convention Hall, Tulsa, Okla. E. L. Fulkerson, Secretary-Treasurer, Waco, Texas.

June 23-25.

SOUTH CAROLINA STATE FIREMEN'S ASSOCIATION.—Tenth Annual Meeting and Tournament, Florence, Ala. R. S. Hovel, Secretary, Sumpter, S. C.

June 23-24.

NEW YORK STATE FIRE CHIEFS' ASSOCIATION.—Annual Convention, Schenectady, N. Y. Chief Yates, Secretary.

June 23-5.

STATE FIREMEN'S ASSOCIATION OF MICHIGAN.—Annual Convention, Saginaw, Mich.

June 23-26.

SOCIETY FOR PROMOTION OF ENGINEERING EDUCATION.—Annual Convention. Prof. H. H. Norris, Secretary, Ithaca, N. Y.

June 30-July 4.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Seventeenth Annual Meeting, Hotel Traymore, Atlantic City, N. J. Edgar Marburg, Secretary, University of Pennsylvania, Philadelphia, Pa.

July 3-4.

AMERICAN SOCIETY OF ENGINEERS, ARCHITECTS AND CONSTRUCTORS.—Midsummer Convention, Brighton Beach, N. Y. T. Hugh Boorman, Secretary, 35 W. 39th St., N. Y. City.

July 4.

SOCIETY OF ENGINEERING CONTRACTORS.—Annual Convention, Brighton Beach, J. Wemlinger, Secretary, 11 Broadway, N. Y. City.

July 17 and 18.

TRI-STATE PACIFIC COAST GOOD ROADS ASSOCIATION.—Annual Convention, Medford, Ore. George E. Boos, Secretary, Medford.

Aug. 5-7.

COUNTY COMMISSIONERS OF PENNSYLVANIA.—Annual Convention, Erie, Pa. T. W. Waterhouse, Chairman Local Committee. Aug. 18, 19, 20.

FIREMEN'S ASSOCIATION OF THE STATE OF NEW YORK.—Geneva, N. Y.

Sept. 11-12.

STATE FIRE MARSHALLS' ASSOCIATION OF NORTH AMERICA.—Annual Convention, Asheville, N. C.

NEW YORK STATE MAYORS' CONFERENCE.

The New York State Mayors' Conference opened its fifth annual convention in Auburn, N. Y., on June 3, with 200 delegates in attendance.

Mayor Fiske, of Mt. Vernon, presided at the first session held on Wednesday afternoon.

An address of welcome was delivered by Mayor Brister of Auburn. The president of the conference, John J. Irving, formerly mayor of Binghamton, gave the presidential address, in which he briefly sketched the work accomplished by the conference during the year. In part he said:

"We have made two surveys of the cities of the state—one dealing with taxation and assessment and the other in reference to city planning. We have also established a temporary municipal information service, held a city planning conference, conducted a statewide municipal welfare campaign, secured the enactment of the Optional City Charter Law and defeated all legislation detrimental to the best interests of municipalities."

Two important committees were named by President Irving:

Committee on Resolutions—Mayor Edwin W. Fiske of Mount Vernon, Mayor J. R. Cline of Amsterdam and J. O. Hammit, Chief of the Bureau of Fire Prevention, New York.

Committee on Nominations—Mayor J. B. Corwin of Newburg, former Mayor and President of the conference C. C. Duryee of Schenectady, Mayor Otto Pfaff of Oneida, Mayor Peter Foley of Olean and Mayor Frank Shall of Little Falls.

City Manager Waite, of Dayton, O., next read his paper on "The Commission Manager Plan—Its Advantages." Discussion of the address was opened by Richard S. Childs, of New York City, and Mayor Canfield of Kingston.

A paper on "Municipal Home Rule Campaign—the Next Steps," was read by Robert S. Binkerd, secretary City Club of New York. Discussion was led by Walter T. Arndt of New York City.

Owing to pressing business Gov. Glynn was prevented from attending the conference and delivering his address on "The State and the Municipality."

At the second session, on Wednesday evening, Mayor Cornelius F. Burns, of Troy, presided. Chief Beaver's (police chief of Atlanta, Ga.) paper

on "The Effect of Atlanta's Campaign Against the Segregated District" was read by a local official. Discussion followed, in which Chief Quigley, of Rochester, and Mayor Lybolt, of Port Jervis, took part.

An interesting address was next read by Joseph Hammit, chief of New York City Fire Prevention Bureau. In the discussion Miss Frances Perkins, secretary of the Committee on Safety, New York City, Fire Chief Yates, of Schenectady, and Mayor Hoffman, of Elmira, participated.

The delegates at the close of the second session were invited to the drill grounds, where they witnessed a Pompier exhibition given by the local fire department.

A symposium of municipal needs occupied the entire time of the third session on Thursday morning, at which mayors and their representatives had five minutes each in which to discuss this important question. Following this session was a municipal parade showing the equipment of the various departments of the city of Auburn.

With Mayor Thomas Tree, of Ithaca, in the chair the fourth session began promptly at 2:30 p. m. The reports of the Advisory Committee of the city planning experts and of the Legislative Committee were read and following resolutions were adopted:

"Whereas, the constitution of the state provides for city elections separated from state and national elections, and

"Whereas, the constitution, therefore, recognizes that local elections ought to be settled on local issues, therefore be it

"Resolved, that the conference recommends the enactment of an optional law under which cities may secure non-partisan municipal elections if they so desire.

"Whereas, one of the greatest difficulties that the courts, the Legislature and the municipal officials have had to face in dealing with municipal subjects, is the almost universal lack of proper codification of local municipal laws and ordinances, be it

"Resolved, that the president of the conference appoint a committee of three to devise and promote a plan for the codifications of local laws and ordinances of the cities.

"Whereas, the home rule constitutional amendment which forms a part of the legislative program of this conference, after having passed unanimously the Assembly, was killed in the Senate and

"Whereas, it is now impossible to obtain the necessary legislative approval of this amendment prior to the Constitutional Convention which is to meet next April, be it

"Resolved, that the conference recommends to the convention the incorporation of an article into the constitution similar to that proposed this year, and that it empower and direct its Legislative Committee and such others as they may choose to associate with them to appear before the convention and to urge the consideration of this amendment.

"Resolved, that the president appoint five members, of which the president shall be one, to constitute a committee on the extension of membership.

"Resolved, that the Committee on Taxation be requested to make to each mayor a report and recommendations on the methods of assessment and taxation in his city.

"Resolved, that the president appoint a committee of five to make a health survey of the cities of the state in co-operation with the State Health Department.

"Resolved, that the president be empowered to increase the membership of the Advisory Committee of City Planning Experts.

"Resolved, that the president appoint a committee of three mayors to confer with the organization of village presidents in this state in order to devise and promote a plan of co-operation.

"Resolved, that the Legislative Committee be directed to advocate the enactment of legislation making persons and corporations responsible for the occurrence or spread of fire by reason of their failure to comply with laws and ordinances and valid orders of municipal authorities liable to the respective municipalities for the cost of extinguishing such fires, and to firemen and others injured in person or property by such fires for the damages sustained by them."

The following officers were elected for the ensuing year: President, Roslin M. Cox, Middletown; vice-president, Louis Will, Syracuse; treasurer, George A. Brock, Lockport; secretary, C. P. Capes, New York. The following were elected members of the bureau council; Joseph T. Lennon, Yonkers, chairman; J. J. Irving, Binghamton; Otto Pfaff, Oneida; W. J. Griffing, New Rochelle, and Thomas M. O'Neill, Auburn.

Troy was named as the conference city in 1915.

A paper was read by C. D. Lay, formerly landscape architect of New York City, on "Parks and Playgrounds—a Program of Development," which was later discussed by J. H. O'Neill, formerly mayor of Auburn. Prof. Pray, of Harvard University, then read his address on "Making the Survey for a City Plan." In the discussion

Mr. Laptrobe of New York city took part.

At 5 p. m. a reception was tendered the delegates, including Mayor Mitchel, of New York, at the home of Mr. and Mrs. Richardson.

The evening session of Thursday was thrown open to the public in the large auditorium and Mayor Brock, of Lockport, presided. The report of the Municipal Bureau Committee was first read, after which Mayor Mitchel spoke of his trip through the west, what he learned from the educational systems there and the relation of the city to its employees. His address was followed by a discussion by Mayor Will, of Syracuse, and Chamberlain Bruere of New York City. The second paper, on "What the Conference Tax Shows," was read by Lawson Purdy, president of the department of taxes and assessments of New York. The discussion was entered into by Mayor Cox, of Middletown, Mayor Griffing, of New Rochelle, and Mayor Shall, of Little Falls.

Following this meeting the delegates assembled in the dining room of the Osborne House for a luncheon given delegates by the city of Auburn.

The sixth session of the conference took place on the morning of June 5, with Mayor Lennon, of Yonkers, as the presiding officer. Dr. Biggs, State Health Commissioner, spoke on: "An Efficient Municipal Health Program—How the State Will Help," and his address was scheduled for discussion by Mayor Schoolcraft, of Schenectady, Mayor D. Pfaff, of Oneida and Mayor Cline, of Amsterdam.

The last paper was read by Dr. Donald B. Armstrong, Supt. Bureau of Public Health and Hygiene, New York City. His subject was: "Public Health Values—A Few Modern Fallacies." The discussion was entered into by Dr. Goler, of Rochester; Mayor Fox, of Fulton, and Mayor L. Van Hoesen, of Hudson.

Upon adjournment the delegates were taken by steamer to Koenig's Point and were the guests of the City of Auburn at a shore dinner.

National Electric Light Association.

With nearly 5,000 members in attendance the National Electric Light Association opened its annual convention on June 1st with an address by President J. B. McCall, and a ball given at the Bellevue-Stratford. President McCall spoke of the great future of electricity and against the attacks being made upon so-called predatory corporations. A report issued by the Committee on Progress states that water power should be extensively utilized in the generating current, indicated the risks taken in converting water power and hoped for more favorable legislation.

In the morning session of Tuesday, June 2, a paper on safety was read by Paul Lupke, of the public service corporation, New Jersey. He spoke of the need of construction in place of flaw-picking and quibbling over theories. Dr. Steinmetz delivered an address on "The Electric Vehicle." He

declared that the automobile of the next decade would be a complete change to the electric type for ordinary city and pleasure use. The use of such vehicles, he asserted, would create the long-sought demand for "idle" electric current. He pointed out that the big gasoline touring car will stay as a means of short-cutting train schedules and cross country pleasure trips, but that electricity will oust it in most other fields. Dr. Steinmetz also predicts that an electric automobile weighing 1,000 pounds would be placed on the market at a cost of \$500. After the important business of the day, the evening was given over to recreation at Willow Grove. In the afternoon, the ladies were entertained by a special musicale at the Manufacturers' Club.

The feature of Wednesday's session was the address delivered by Thomas A. Edison, in which he said that an electric airship would be brought into use and that current will soon be obtained from coal without steam or dynamo. The Public Policy Committee asserted that the electric companies disliked government ownership of public utilities, for it was considered impossible for private companies to compete with the unlimited resources of the government.

Other committee reports follow: "Electrical Apparatus," by L. L. Elden, of Boston; "Temperature and its Effect on the Power Capacity of Electrical Apparatus," F. D. Newbury, of Pittsburgh; "Underground Construction," Philip Torchio, New York; "Overhead Line Construction," by Thomas Sproule, this city; "Rate Research," E. W. Lloyd, Chicago; "Lamps," by F. W. Smith, New York; "Uniform System of Accounts," John L. Bailey, Baltimore; "Appraisals," Dr. D. C. Jackson, Boston; "Variations in Public Service Systems of Accounting," E. C. Scobell, of Rochester.

At the concluding meeting of Wednesday's session, held in the ballroom of the Bellevue-Stratford, short addresses, reminiscent of past efforts to develop the electrical industry, were made by F. J. Sprague, a pioneer in trolley car development; Dr. Charles Brush, who brought the arc light into everyday use, and E. W. Rice, Jr.

On Thursday the delegates to the convention were given an opportunity to hear the report of Prof. Hugo Munsterberg, of Harvard, on the psychology of street lighting. He said in part:

"The discussion of the electric-lighting problem seems to me to have suffered so far from a neglect of the higher mental processes involved. All the studies which refer to psychological factors at all are essentially confined to the mere process of seeing, especially to the acuity of vision.

"This is insufficient for the situation in a room, and still more in the street. The mere possibility of visual discrimination does not insure comfort and still less safety on the street. The most essential point is to have an illumination by which the attention is kept vivid and all the mental functions active.

"Fair chances to see are of small use, if the pedestrian or the driver come into a benumbed state in which their attention is dulled and in which their reactions are slow.

"Offhand and without having carried on any experiments whatever, I should be inclined to say that a uniform illumination, like that of Detroit, would be unfavorable for the attention. It would produce a hypnoid state.

"Our attention is naturally fluctuating and will best be kept awake, if the illumination produces an alteration between tension and relaxation. This demands that there be darker regions between the lighted spots.

"The lights ought not to be too glaring. There ought not to be any binding effect, the more as the after images interfere with good seeing. On the other hand, the lights ought to be strong enough to allow rather large distances.

"If they stand too near together, too many fall in the side parts of the retina, and every movement in walking or driving, therefore, produces too much alteration in the side parts of the visual field. This creates a disagreeable irritation and withdraws the attention from the object of direct vision."

Reports presented Thursday follow: "Hydro-Electric Progress," by T. C. Martin; "Nature of Electrical Disturbances in Transmission Work," D. B. Rushmore, Schenectady, N. Y.; "Data on Modern High-Voltage Transmission Systems," by Selby Haar, of New York; "Water Power Plant Economics," O. B. Caldwell, Portland, Ore., and "Hydro-Electric Development in California," by John A. Britton, San Francisco.

"Accounting for Merchandise Sales," H. B. Lohmeyer, Baltimore; "Suspense Accounts," Frederick Schmitt, New York; "Mechanical Sorting and Tabulating Systems," F. A. Birch, Philadelphia; "Purchasing, Storing and Accounting of Coal for the New York Edison Company," Charles R. Lehmann, New York; "Interurban Lighting of Highways," George B. Tripp, Harrisburg, Pa.; "Non-Peak and High Load-Factor Business," G. H. Jones, Chicago.

"Wiring of Existing Buildings," R. S. Hale, Boston; "Prime Movers," I. E. Moulthrop and J. F. Vaughan, Boston; "Selection of Hydraulic Turbines," Charles V. Seastone, Madison, Wis.

Elbert Hubbard entertained the delegates at the morning session with an address upon "The Age of Co-operation."

Susquehanna River power as a probable future source of electric current for electrification of railroads around Philadelphia was on Friday in the contemplation of the National Electric Light Association, when its delegates visited and viewed the eight-mile dam and 125,000 horsepower undershoot turbine sand generators at Holtwood as guests of the Pennsylvania Water and Power Company.

Election of officers was held in the

morning, Holton Henry Scott being chosen president to succeed Joseph B. McCall, of Philadelphia. Mr. Scott is the youngest man ever elected to the presidency. He is general manager of the Doherty Operating Company of Brooklyn.

Other officers elected were: First vice-president, E. W. Lloyd, Chicago; second vice president, H. A. Wagner, Baltimore; third vice president, L. D. Gibbs, Boston; fourth vice-president, J. S. Blecker, Columbus; secretary, T. Commerford Martin, New York; treasurer, W. F. Wells, Brooklyn. Three members of the Executive Committee for three years: Paul Spencer, Philadelphia; A. C. Einstein, St. Louis; Walter Numiller, New York.

It was decided to hold the next annual convention at San Francisco.

Canadian International Good Roads Congress.

During the week beginning May 18 the First Canadian International Good Roads Congress was held in Montreal. A large number of delegates were in attendance.

The opening session on Monday afternoon was devoted to several addresses by Chairman U. H. Dandurand, Sir Francois Langelier, Lieut. Governor of Quebec, and Sir Lomer Gouin, Premier of Quebec. Secretary of State Hon. Louis Coderie said in his address that he looked forward to an early arrangement between the Federal and Provincial governments respecting a grant for road construction and improvement. Highway legislation formed the subject of an address by W. A. McLean, president of the American Road Builders' Association. Dr. E. M. Desaulniers spoke on road legislation for the Province of Quebec. An interesting paper was next presented by S. W. Johnson, chief state highway engineer of Illinois, on "Planning of System of Public Roads."

In the evening and on other evenings throughout the convention illustrated lectures were given by the manufacturers of road-building materials and machinery.

The papers read on Tuesday were as follows: "Important Considerations Entering into the Selection of Pavements for Roads and Streets," by W. H. Connell, chief of Bureau of Highways, Department of Public Works, Philadelphia, Pa.; "Maintaining Macadam Roads," by E. O. James, consulting engineer to the York County Highway Commission; "Points Worth Knowing in Connection with Road Improvement," by Major W. W. Crosby of Baltimore; "Good Roads as a Factor in the Progress of Cities and Towns," by Lieut.-Col. W. N. Ponton, and an address in French by R. Lehman, engineer of French Government Service, New York City, on the administrative organization by which French roads are constructed and maintained.

On Tuesday evening a banquet was given at the Hotel Windsor and on Wednesday morning a tour of inspection was made of streets and roads in and around Montreal.

The delegates at the Wednesday afternoon session heard these addresses: "Road Improvements in Beaconsfield, P. Q.," by C. L. Storey; "Concrete Roads and Streets," by L. P. Turgeson, assistant secretary, Association of American Portland Cement Manufacturers; "Modern Bituminous Surfaces and Pavements," by Prof. Blanchard of Columbia University; "Technical Training for Highway Engineers," by A. T. Lang, Department of Highway Engineering, University of Toronto; "Road Designing," by R. A. Meeker, engineer, Department of Public Works, New Jersey; "The Economy of Brick Highway," by W. P. Blair, secretary, National Paving Brick Manufacturers' Association; "The Relation to the Technical Press of the Good Roads Movement," by H. Irwin, editor of the Canadian Engineer.

At Thursday's session, the papers read were: "The Relation of the Motorist to the Good Roads Movement," by O. Hezzelwood, chairman of the Canadian Automobile Federation; "Modern Road Construction in the United States and England," by T. Hugh Boveman, secretary of the American Society of Engineers, Architects and Constructors; "Automobile Organization and Harbor Improvement," by W. G. Robertson, secretary of the Ontario Motor League; "Bulk Handling of Cement," by H. M. Capion of Chicago, and "The Construction of Modern Highway Bridges," by Lucius E. Allen, consulting engineer, Belleville, Ont.

The following officers were elected: Honorary president, A. U. Dandurand, Montreal; president, W. A. McLean, Toronto; secretary, G. A. McNamee, Montreal.

PERSONALS

Prof. C. E. A. Winslow will resign as associate professor of biology at the College of the City of New York at the end of the present school year to become director of the Division of Publicity and Education of the recently reorganized New York State Department of Health. Prof. Winslow's headquarters will be at the New York City offices of the State Department of Health, 25 West 45th street. He will continue as Curator of Public Health at the American Museum of Natural History and Associate in sanitary science at Teachers' College, Columbia University.

J. A. Mesiroff, formerly city engineer of Milwaukee, Wis., is now chief engineer of the Western Engineering & Construction Company, of Milwaukee.

Lester Gibson, formerly assistant city engineer of Pasadena, Cal., has been appointed an assistant California State engineer on State highways in the south of the State.

W. Crighton Harris has resigned from the engineering firm of Crighton Harris & Company to become chief engineer of the Titan Storage Battery Company, of Newark, N. H.

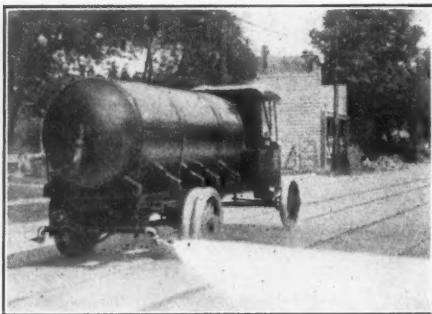
(Continued on page 872.)

NEW APPLIANCES

ELECTRIC SPRINKLER TRUCK.

5-Ton Automatic Sprinkling and Flushing Machine with 1,200 Gallons Capacity.

The General Motors Truck Company, Pontiac, Mich., is building a special 5-ton sprinkler truck, drawn by storage battery power. The tractor is a regular electric tractor fitted with a box for 48 storage batteries which may come in any one of four types: Edison A-12 or A-10, 21-plate Ironclad Exide or 25-plate Hycap Exide. The complete capacity of the tank is 1,200 gallons, but the air compartment takes up



ELECTRIC FLUSHER.

about 25 per cent of the total volume—the air being necessary in flushing. The tank is 160 inches long and has an inside diameter of 51 inches. The capacity of the air tank is 65 pounds. The tank is provided with air and water pressure gauge and a safety valve in the by-pass connecting the water space with the air chamber. The tank is filled by means of a 2½-inch intake check-valve located in the center of rear drum-head. The water discharge is controlled through lever gate valves operated by hand levers near driver's seat. The main outlet connection is 4½-inch standard pipe and the flushing nozzle connections 2½-inch pipe. There is a 10x16 inch manhole in the rear top of the tank. The two flusher nozzles may be worked either separately or together.

In operation both outlets and heads are closed for filling and valve No. 1

opened—the other valve being closed—so that there is an air passage from the water to the air compartment. Hose is then attached to the hydrant and the tank filled until the rear gauge registers 80 per cent of the hydrant pressure. Valve No. 1 is then closed to hold the compressed air in the chamber. The tank is drained by opening both flushing heads and valve No. 2 in flushing the outlet valve leading to the nozzle is opened by means of the lever at left of driver and the result is a stream of water under pressure directed along the surface. In sprinkling, of course, the pressure is not needed.

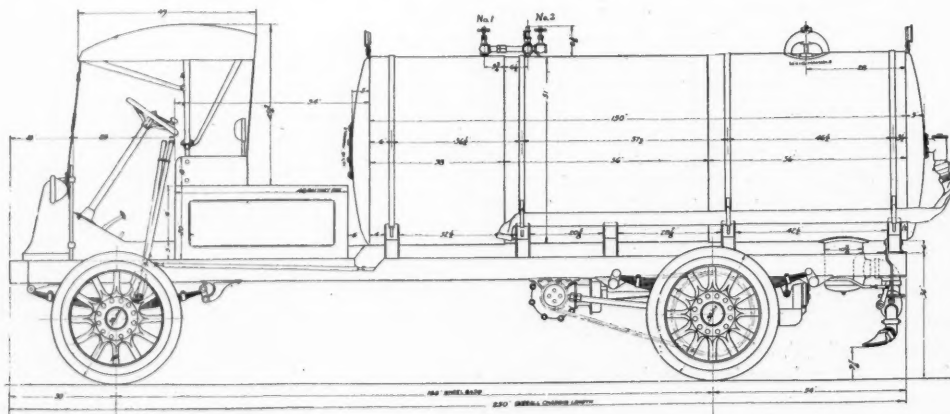
Two of these tanks went into service in Calgary, Alberta, Can., last July and detailed records of their performance have been officially reported. The highest day's run was 42 miles for eight hours. The average was 11 miles sprinkled three times daily in eight hours. Comparing horse-drawn flushers and sprinklers with the electric proved that the electric sprinkler will do on an average 33 miles a day or the work of three teams. The flusher, working eight hours at night does the work of two teams—a total of five teams. The detailed costs were as follows:

Detail Cost of Operating Each GMC Electric Sprinkler and Flusher.

Electricity	\$1.30
Garage charges	1.40
Driver's wages (one day, one night)....	6.00
Rent at \$10.00 per month.....	.40
Special battery depreciation.....	1.00
Total	\$10.10

Detail Cost of Operating Each Horse-Drawn Sprinkler and Flusher.

Feed per team.....	.80
Horseshoeing, repairs to harness, share of stable expenses, etc.....	.50
Driver's wages	2.90
Depreciation, loss of stock, etc.....	.25
Total	\$4.45
Total cost of running motor sprinkler and flusher per day of sixteen hours..	\$10.10
Total cost of doing the same work with five teams	22.25
Each motor sprinkler and flusher saves each day the sum of	12.15
Two electric motor sprinklers and flushers save the city each day of sixteen hours	24.30

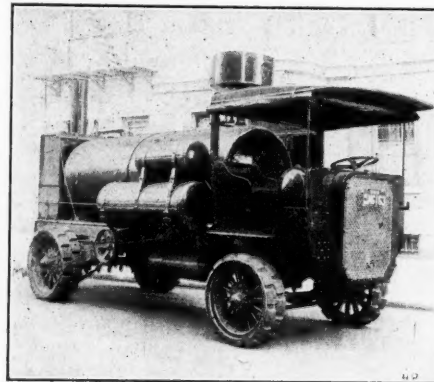


ELECTRIC AUTOMATIC SPRINKLER AND FLUSHER.

"HOT PENETRATION" ROAD OILER.

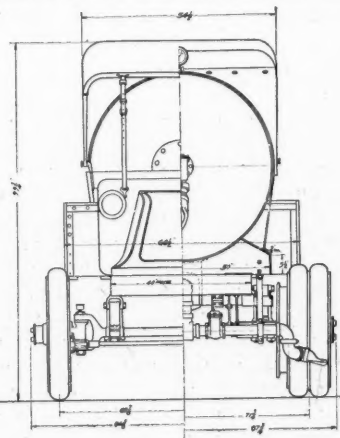
A 5½-ton Hewitt Oiler for Applying Hot Bituminous Binder Under Pressure.

A unique road construction machine, the 5½-ton Hewitt "Hot Penetration" Road Oiler, shown in the illustration has just been built by the International Motor Company, New York. This motor truck is equipped with road-oiling apparatus, designed for applying



ROAD OILER SHOWING TANKS.

binders to roads in course of construction. This oiler should not be confused with a machine for laying dust—it is a purely constructive piece of machinery for building roads. The rock construction of road built by this machine—the "penetration method"—is, of course, very similar to the old-fashioned macadam. A permanent foundation is first laid, after which large crushed stone is applied according to the road specifications. The "hot road oiler" is then run over the road, applying a hot bituminous binder, which is forced on to the crushed stone under pressure. The hot oil fills up the interstices between the stones, holding them in place. As the binder hardens the stones are held more firmly in place, forming a solid mass of crushed stone and bituminous ma-



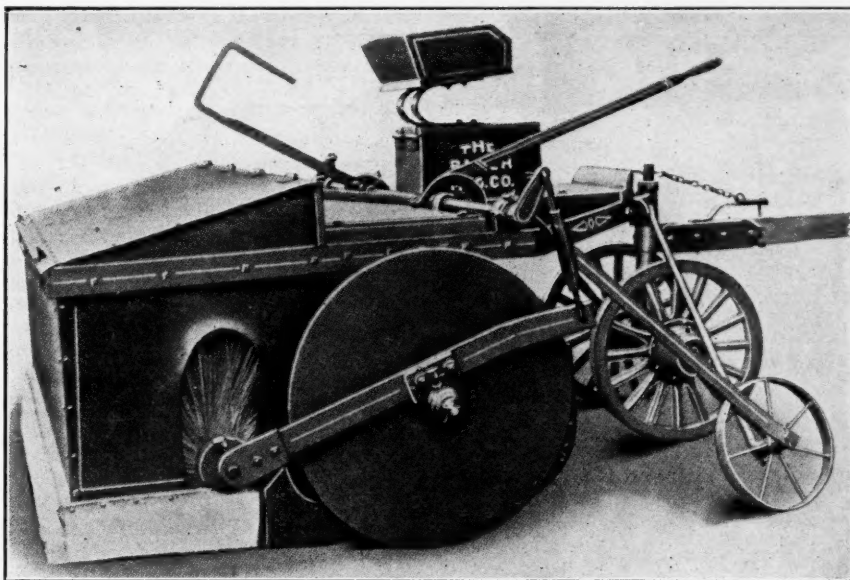
terial. When the first course is finished another layer of stone is rolled into place, the stones coming in contact with each other by the pressure of the steam roller; again a hot binder is applied by the "hot road oiler," filling up any crevices. In this way a solid road is obtained with no openings between the stones, and no moisture can get into the road and disturb its surface when it freezes, as is frequently the case in macadam roads. The stones are gripped in the bituminous binder and all spaces filled up, so that the stones can hardly be picked out by automobile traffic.

The machine, specially constructed for this class of work, is a 5½-ton Hewitt truck, having sliding gear transmission with wide ranges of speed. The large tank holds 750 gallons of binder. The binder in the tank is heated by coils of pipe filled with steam. This steam is generated in the flash boiler at the rear of the truck. The boiler is fired by fuel oil which is carried in the upper cylindrical tank on the right-hand side of the truck. The steam from this boiler is also used to run a reciprocating "plunger type" air compressor. The air pressure forces the binder in the large tank on to the road. The lower cylindrical tank on the right-hand side of the truck carries the water for the boiler. The boiler is also provided with an air primer for starting the fire underneath the boiler. Suitable arrangements have been provided for straining the binder when it is taken from the tank before reaching the distributing manifolds situated underneath the boiler at the end of the truck.

The operator is stationed at the rear of the truck, directly above the manifolds, so that he can control and regulate the application of the binder to the road. Provision is made for attaching a nozzle and hose to the dis-

tributing manifold and applying the oil locally by hand. A full range is reached for the application of the binder, by varying the air pressure on

greater volume of sound, which though soft and pleasing near by, extends over a large range. The gongs are made in 8-inch and 10-inch sizes with two bells



"TWENTIETH CENTURY" PICK-UP SWEEPER.

the tank, by opening and closing the manifold nozzles, by varying the temperature at which the binder is applied, and by running the truck at different speeds. The binder can be applied at the rate of from ¼ gallon per sq. yd. to as much as 2 gallons per sq. yd. This machine is one of the various types that the Standard Oil Company have in service in various parts of the country, and which they find of great service in road work.

STEAM FIRE GONGS.

The Union Water Meter Company, Worcester, Mass., are making steam fire gongs which differ from the ordinary steam whistle in producing a

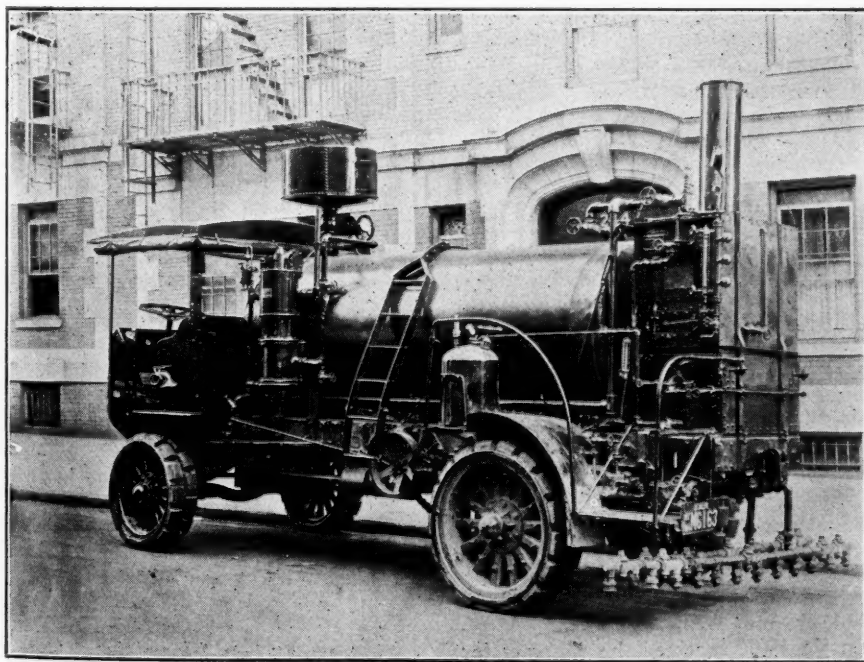
and a 12-inch size with three bells. The two larger bells produce the volume and power of sound to cover long distances, while the small bell has penetration, thus making the three-bell gong a very effective fire alarm signal. The valves furnished with 8-inch and 10-inch gongs are fitted with levers and the 12-inch gong with a wheel for operating.

PICK-UP STREET SWEEPER.

The "Twentieth Century Sweeper" Fitted With Gutter and Guide Wheels.

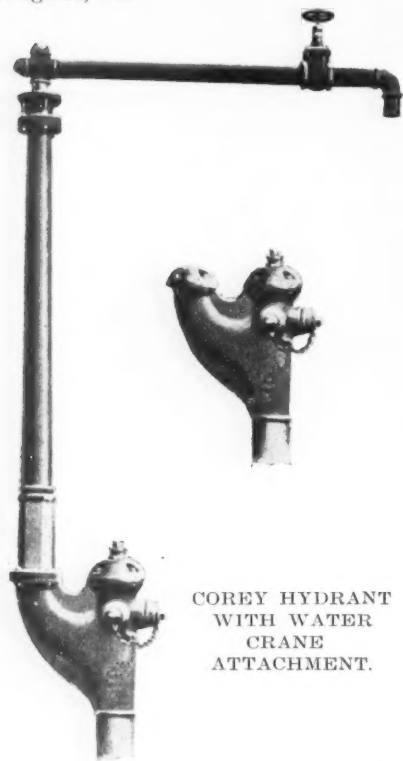
The Baker Manufacturing Company of Springfield, Ill., is making a "pick-up" sweeper, one of their line of "Twentieth Century" street and road machines. This is an enclosed, dustless sweeper which picks up and carries the sweepings and which is designed to sweep the gutter. The driving mechanism consists of a sprocket wheel and chain which turn a short shaft keyed to a large gear. This gear drives the broom rapidly in the opposite direction, thus sweeping into the dust pan carried in front of the broom. The capacity of the pan is about ten cubic feet. In dumping, the lever at the driver's left is pulled back and a chain lifts the pan, allowing the contents to spill. Another lever is then pulled forward, lifting the broom and allowing it to pass over the dump. The pan is then closed, the broom dropped and the sweeping resumed.

There is no spill at the end of the sweeper, this being prevented by fenders on the ends of the dust board or lip of pan. The gutter is swept just as well as the center of the street. The guide wheel is designed to prevent the large cast iron gutter wheel from striking or damaging the curb or causing the sweeper to swerve.



"HOT PENETRATION" ROAD OILER.

One of these sweepers has just been sold to the city of Portland, Ind. Others are in use in Galesburg, Ke-wanee and Alton, Ill., Waxahachie, Tex., San Francisco, Maryville and Los Angeles, Cal.



COREY HYDRANT
WITH WATER
CRANE
ATTACHMENT.

WATER CRANE ATTACHMENT Fitted to Corey Hydrant for Filling Sprinkling Carts.

In the Corey hydrant with the water crane attachment, when the sprinkling season is over, the attachment can easily be removed by loosening four bolts and a dome-shaped cover substituted. This leaves the hydrant with a neat appearance during the winter. The side-arm from the hydrant is arranged to set parallel with the sidewalk curb, so as to take up no more room from sidewalk than a regular hydrant. The swinging arm is arranged to swing around and deliver water at any point within the circle; the swing bearing is bronze mounted and the arm cannot sag from its own weight nor be blown out of the stuffing box by pressure. When in use for supplying sprinkling carts, the main hydrant valve remains open, the flow of water being regulated by the valve in the swinging arm. When the main hydrant valve is closed, all the water is drained from both the crane and the hydrant barrel through a drip valve at the bottom of the hydrant. The illustration shows the hydrant with the crane and also as it appears in winter. The dimensions are: Length of swinging arm, 5 feet; distance from and to underside of swinging arm, 9 feet; inside diameter swinging arm, $2\frac{1}{2}$ inches. This crane is made by the Rensselaer Valve Co., Troy, N. Y.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago Quotations: 4 inch, \$26; 6 to 12 inch, \$24; 16 inch and upward, \$23.50. Birmingham, inquiries better and prospects said to have improved. Quotations: 4 inch, \$20.50; 6 inch and upward, \$18.50. New York, market not active. Quotations: Carload lots of 6 inch, \$20.50.

Lead.—St. Louis, \$3.80. New York, \$3.90.

Universal Portland Cement Co., Chicago.—Mr. C. W. Boynton, for the past ten years inspecting engineer of this company, has resigned to take charge of the construction and operation of the Sonora Magensite Company's properties in California. Mr. Boynton has for some time been a member of many prominent chemical, engineering and contracting associations and has served as chairman of several committees on cement and concrete. He organized and developed the Information and Inspection Bureaus of the company. Mr. W. M. Kinney, assistant inspecting engineer, will take up Mr. Boynton's work.

The H. W. Johns-Manville Co.'s Duluth office has moved to larger quarters at No. 337 W. First street, in order to take care of its increased business. The new office is on the ground floor, with windows for the display of J-M Asbestos Roofing, Pipe Coverings, Packings, Sanitary Specialties, Auto Accessories and other products of this company's well known and varied lines.

Trussed Concrete Steel Company.

On June 1 the general sales offices of the company were removed to its extensive plant in Youngstown, Ohio. The object of this removal is to bring the selling and manufacturing organization into closer conjunction, thereby increasing the efficiency of the service rendered to buyers. District representatives will be maintained, as heretofore, in the various cities throughout the country. A competent engineering and sales organization will be established in Detroit to handle Michigan business. The publicity department of the company remains in Detroit.

Cast Iron Submarine Pipe.—A contract involving the manufacture of 9,800 feet of 36-inch flexible jointed c. i. submarine pipe has been awarded to the Westinghouse Machine Company. The pipe will be used for a siphon under the Narrows in connection with the water supply to be brought from the Catskill Aqueduct and carried to Staten Island.

Alum and Hypochlorite Supplies.—The Pennsylvania Salt Co., Philadelphia, Pa., has been awarded the contract to furnish 200,000 pounds of alum for the city filter plant at \$1.025 per hundred pounds. The Arnold Hoffman Co. have received the contract for hypochlorite of lime at \$1.70 a hundred pounds.

PERSONALS

(Continued from page 869.)

Kellore Norton has been appointed superintendent of the city waterworks and electric light plant at Coldwater, Mich. Mr. Norton is a civil engineer and was graduated from the Case School of Applied Science, Cleveland.

J. S. Bogardus, formerly assistant engineer of the Board of Water Supply of New York City, and later Superintendent of Contract 52, Board of Water Supply, Elmsford, N. Y., for the Pittsburg Contracting Company, has been appointed sales manager for the Blaw Steel Construction Company.

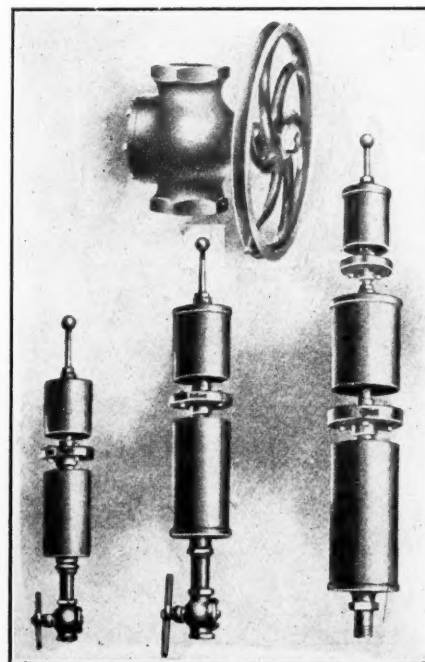
Morton F. Sanborn has been appointed an assistant State sanitary engineer with the New York State Department of Health. Mr. Sanborn will take up the study and inspection of sewage-disposal works in the State. He has made a special study of sanitary engineering, having been connected with this phase of work for the last nineteen years.

Mr. Lawrence S. Kaiser has been appointed Superintendent of Water Works of Portland, Ore.

Mr. S. R. Fisher, assistant city engineer of Springfield, O., has been made city engineer, succeeding Mr. C. E. Phillips, resigned.

Mr. Clinton H. Fisk, Assoc. M. Am. Soc. C. E., consulting engineer, St. Louis, Mo., has been appointed assistant sewer commissioner of St. Louis, at a salary of \$2,500 per annum. Mr. Fisk is a civil engineering graduate of Washington University, class of 1896, and for several years was engineer of construction of the St. Louis & San Francisco R. R.

A. C. Grover, city engineer of Rutland, Vt., has been reappointed city engineer and in addition to his former duties commissioner of public works.



STEAM FIRE GONGS.

ADVANCE CONTRACT NEWS

ADVANCED INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
O., Delaware	10 a.m., June	13..	Grading, draining and paving	F. C. Higley, Co. Supv.
Ind., Indianapolis	10 a.m., June	13..	Gravel road	W. T. Patten, Auditor
Minn., Hastings	June	13..	1.5 inches of clearing, etc., and 1,000 cubic yards graveling	Co. Auditor.
O., Cleveland	10 a.m., June	13..	Improving one road	E. G. Kraus, Clerk of Board
O., Newark	June	13..	Improving two roads, about 3 miles	J. W. Hursey, Co. Aud.
O., Delaware	10 a.m., June	13..	Grading, draining and graveling or macadamizing	F. C. Higley, Co. Surveyor
N. Y., Olean	June	13..	8,400 sq. yds. brick	City Clerk.
Minn., Mahanomen	2 p.m., June	13..	Grading various state roads	T. H. Blanchard, Co. Aud.
N. D., New Rockford	2 p.m., June	13..	Grading in township	W. Stark, Town Clerk.
Wis., Hurley	10 a.m., June	15..	Paving 1,950 ft. 48 ft. wide with brick, including curbing, catch basins, retaining wall, etc.	M. Lambrich, Chm. Town Bd.
Wis., LaCrosse	2 p.m., June	15..	Improving streets	Board of Public Works.
S. D., Rapid City	6 p.m., June	15..	Constructing quantity of cement sidewalks	J. H. Mathias, City Auditor.
Ill., Cicero	8 p.m., June	15..	Preparing macadam foundation and resurfacing with crushed limestone	C. Jefferson, Pres. Bd. Loc. Imps.
Ind., Kokomo	June	15..	5-foot combined cement walk and curb	Board of Public Works.
Mo., Jefferson	8 p.m., June	15..	Curbing, guttering and removing; also resetting old curb and gutter	P. C. Harding, City Engr.
N. Y., Albany	June	15..	Constructing highways in several townships. (See proposal ad.)	J. N. Carlisle, Comr.
Okl., Collinsville	4 p.m., June	15..	Sheet asphalt, asphalt concrete and brick	City Commrs.
Ind., Hammond	10 a.m., June	15..	Cement sidewalks	Board Public Works.
Tex., Belton	June	15..	Constructing road and culvert	E. A. Kingsley, Engr., Temple
Kan., Salina	8 pm., June	15..	Paving, curbing, guttering and excavating, using repressed vit. brick, asphaltic concrete, etc.	City Clerk.
Tex., Corsicana	2 p.m., June	15..	Constructing system of Cardinal highways	H. G. Johnson, Co. Aud.
Mont., Lewiston	June	15..	Improving highway to cost \$19,000	City Clerk.
Pa., E. Lansdowne	8 p.m., June	15..	Constructing 6-inch macadam roadway with rubble intersections	A. F. Damon, Jr., Boro. Engr.
N. Y., Port Jervis	June	15..	5,700 sq. yds. brick	City Clerk.
Wash., Seattle	10 a.m., June	15..	Paving	Byron Phelps, Clk. Co. Comrs.
Ky., Morganfield	June	15..	Brick paving, concrete curb and gutter	City Clerk
Ind., Huntington	10 a.m., June	15..	Roadway	H. Guthrie, Co. Aud.
Pa., Scottdale	7.30 p.m., June	15..	Grading, paving and curbing	F. M. Newcomber, Sec. Council
Ind., Batesville	7.30 p.m., June	15..	Improving one street	Common Council.
Cal., Santa Monica	2 p.m., June	15..	Grading and paving with oil and rock	G. A. Murray, City Clk.
N. J., Westfield	June	15..	Improving sections of streets	A. W. Var, Twn. Engr.
Ind., Battle Creek	10 a.m., June	15..	Improving one highway	H. Guthrie, Co. Aud.
Wis., La Crosse	2 p.m., June	15..	Improving two streets	Board Public Works.
Ky., Lexington	June	15..	Constructing roads with asphalt macadam, brick and concrete; cost, about \$200,000	J. W. Guyn, Auditor
O., Antwerp	June	15..	3/4 mile brick and concrete pavement, cost \$38,000	T. C. Banks, City Clerk.
Tex., Waco	10 a.m., June	15..	Constructing five roads and five bridges	W. T. Lockwood, Co. Aud.
Tex., Harlingen	June	15..	182,000 sq. ft. sidewalk; 21,350 ft. curb and 9,500 ft. curb and gutter	City Clerk.
Ill., Elgin	June	15..	Paving with asphaltic concrete, 30,000 sq. yds.	M. H. Brightman, Engr.
Ala., Mobile	Noon, June	15..	20,400 sq. yds. 2-in. asphaltic concrete pavement on concrete base, 14,200 ft. of granite curbing	W. Smith, City Engr.
Ind., Vincennes	3 p.m., June	15..	Constructing cement sidewalks, combined curb and gutter	Board of Public Works.
Pa., Kittanning	8 p.m., June	15..	3,500 ft. concrete curb and gutter, vit. block pavement; 3,800 sq. yds., &c.	O. S. Geiger, Clk. of Council.
Wis., New London	8 p.m., June	16..	Constructing cement sidewalks for 1914	C. J. Thompson, City Clk.
Wis., Green Bay	10 a.m., June	16..	Constructing large amount of sidewalks	D. J. Deyer, Ch. Com. on Sidewalks.
Pa., Harrisburg	10 a.m., June	16..	Paving with various materials in several towns	State Highway Dept.
Ky., Versailles	7.30 p.m., June	16..	6,000 sq. yds. vit. brick pavement on concrete	City Clerk
Va., Lexington	3 p.m., June	16..	Grading work involving 35,000 cu. yds. of excavation	N. B. Corse, Sec. Building & Ground Committee.
Utah, Ogden	10 a.m., June	16..	Sidewalks	Board Commissioners
Ind., Hartford City	2 p.m., June	16..	Macadam	James Cronin, Co. Aud.
O., Columbus	June	16..	Grading, curbing and paving with asphalt or wood block	Dir. of Public Service.
Mass., Boston	June	16..	10,000 sq. yds. asphalt, bitulithic or wood block	Sec., Boston Transit Comn.
Wis., New London	June	16..	Cement walks	J. C. Thompson, City Clk.
Kan., Olathe	noon, June	16..	Three miles of road	W. J. Moore, Co. Clk.
O., Columbus	June	16..	Paving in several counties	J. R. Marker, Comr.
Pa., Johnstown	4 p.m., June	16..	5,872 sq. yds. street paving and 1,031 cu. yds. concrete	O. P. Thomas, Boro. Engr.
N. Y., Brooklyn	11 a.m., June	17..	Regulating and repaving with granite and asphalt	L. H. Pounds, Pres.
Ill., Breeze	8 p.m., June	17..	Cement sidewalks and crossings. (See proposal ad.)	C. C. Eulberg, City Clk.
N. J., Fairlawn	June	18..	Excavating and macadamizing	Township Clerk.
Fla., Jacksonville	3 p.m., June	18..	Paving with vit. brick 7,920 ft. 24 ft. wide	Chr. Co. Comrs.
Neb., David City	5 p.m., June	18..	Cement walks	M. J. Holland, Co. Clk.
O., Springfield	Noon, June	18..	Furnishing materials and constructing roadway	C. E. Ashburner, City Mgr.
N. J., New Brunswick	8 p.m., June	18..	Regulating, grading and paving several streets	John J. Curran, Street Comr.
O., Lima	Noon, June	18..	Repaving stretch of pike with broken stone, slag or binder	H. J. Lawlor, Clerk of Board.
O., Mansfield	Noon, June	19..	Paving several streets and constructing sanitary sewers	O. Hursh, Dir. of Serv.
N. J., Hackensack	June	19..	Improving	Board of Freeholders.
O., Upper Sandusky	June	19..	10,975 ft. grading and stoning	County Auditor.
Ind., Warsaw	10 a.m., June	19..	Gravel	County Auditors.
O., Cincinnati	June	19..	Repairing one road	A. Reinhardt, Clerk
Pa., Reading	11 a.m., June	19..	Paving with several materials on several streets. (See proposal ad.)	J. H. McConnell, Supt.
Ark., Lonoke	June	20..	Eleven miles of macadam road	Board Comrs.
Ind., Fort Wayne	10 a.m., June	20..	Grading, draining and paving with stone	D. H. Brown, Co. Aud.
O., Toledo	10 a.m., June	21..	Repaving road with Bermudez asphalt	P. J. Sanzenbacher, Aud.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Tex., San Antonio	....4 p.m., June 22.	Paving certain streets, about 890,000 sq. yds. in area. (See proposal ad.)	Fred Fries, City Clk.
N. J., Elizabeth	.....June 22.	Constructing brick pavement, flagging and curbing, etc.	W. P. Neatsey, St. Comr.
Kan., Coffeyville	.....Noon, June 22.	Constructing bridges and culverts	City Clerk.
Minn., Mankato	.....3 p.m., June 22.	10,500 feet of road	C. L. Kennedy, Co. Aud.
Tex., San Antonio	.....June 22.	690,000 sq. yds. paving	City Clerk.
Ind., Fort Wayne	.....10 a.m., June 22.	Grading, draining and paving with concrete	D. H. Brown, Co. Aud.
S. D., Colome	.....8 p.m., June 22.	Constructing 1,000 ft. of 12-ft. cement sidewalk	P. E. Bingham, Town Clerk.
O., Antwerp	.....June 23.	Paving one street	Village Clerk.
N. J., Passaic	.....2 p.m., June 24.	Improving several streets	I. Wollenberg, Dir.
N. J., Paterson	.....June 24.	Bituminous concrete	Board of Freeholders.
Ark., Fort Smith	.....Noon, June 25.	Paving 17,800 sq. yds. wood block, brick asphaltic concrete or plain concrete	H. C. Read, Ch. Bd. Imp.
Wis., Janesville	.....2 p.m., June 25.	5,826 ft. of combined cement curb and gutter; 360 ft. of cement covered gutter	Board Public Works.
Minn., Crookston	.....2 p.m., June 25.	Graveling state road, 1,834 cu. yds.	H. J. Welte, Co. Auditor.
Wis., Delavan	.....10 a.m., June 27.	Cement curbs and gutters	W. H. Horton, Chm. St. Com.
O., Cambridge	.....About July 28.	Paving various streets	G. B. Clark, Dir. P. S.
O., Marion	.....noon, June 30.	Constructing paving and sandstone sidewalks	H. C. Cass, Dir. P. S.
O., Shelby	.....June 30.	Grading, draining, curbing 3,100 sq. yds., either brick, water-bound macadam or bitumen macadam	C. A. Schikler, City Engr.
S. D., Alexandria	.....July 1.	Five miles of grading	County Auditor.
Miss., Forest	.....11 a.m., July 6.	Six miles	W. A. Turner, Sec. Hwy. Comm.
N. J., New Brunswick	.....July 6.	Paving one street	City Clerk.
Minn., Shakopee	.....10 a.m., July 13.	Road culverts	A. J. Meyer, Co. Auditor
SEWERAGE				
Cal., So. Pasadena	.....noon, June 13.	Constructing complete sewer system to cost \$200,000	B. V. Garwood, Clk.
Cal., Pasadena	.....About June 14.	Various sewer improvement, cost \$10,000	R. V. Orbison, Dep. City Engr.
Ill., Elgin	.....June 15.	36,000 ft. 6 to 15-in. sewer	M. H. Brightman, Engr.
Wis., Kenosha	.....2 p.m., June 15.	500-foot 15-inch vit. pipe sewer	Street Assessment Com.
Ala., Mobile	.....Noon, June 15.	Storm sewer, about 19,500 ft., sizes from 6 to 24-in., including 36 manholes, 60 inlets and 12 basins	W. Smith, City Eng.
Kan., Independence	.....June 15.	Five blocks of 8-inch pipe sewer	T. H. Kriehagen, City Clk.
N. J., Milltown	.....2 p.m., June 15.	Furnishing labor, material, etc., for sewerage system, consisting of 8 miles vit. pipe, sewage pumping station, etc.	R. A. Harkins, Boro. Clk.
Pa., Plains	.....7.30 p.m., June 15.	Sewerage, grading, paving, etc.	W. Rowlands, Sec. Bd. Comrs.
S. D., Tripp	.....July 15.	Constructing sewer system and sewage treatment plants	Dakota Engrg. Co., Mitchell.
Ia., Bettendorf	.....June 15.	Sewer system amounting to \$34,000, including septic tank, pipe from 8 to 18-in.	City Clerk.
M. Wh. Sulphur Spgs.	.....8 p.m., June 15.	Sanitary sewer system and disposal plant	G. Wallwork, Town Clerk.
Minn., Winona	.....June 15.	Sanitary sewer in four streets	City Clerk.
O., Springfield	.....noon, June 15.	Combined sewer	C. E. Ashburner, City Mgr.
Mich., Flint	.....June 15.	Vitrified and cement sewer pipe, fittings and castings	City Clerk.
O., Cleveland Heights	.....noon, June 15.	Storm and sanitary sewers	H. C. Canfield, Clk.
Ind., Kokomo	.....June 15.	Constructing 10-inch vit. pipe sewer	Board of Public Works.
Wis., Manitowoc	.....10 a.m., June 15.	2,050 ft. 8-in. sewer, 3 manholes and 2 catch basins; vitrified pipe	A. Reichert, City Clk.
Minn., Eveleth	.....June 16.	Extending storm water sewer	C. M. Dorway, City Engr.
O., Akron	.....June 16.	Sewage treatment plant	I. A. Priest, Clerk
N. J., Newark	.....2 p.m., June 16.	Main intercepting sewer in Paterson	Passaic Valley Sewer Comrs.
N. C., Washington	.....June 17.	Constructing 8 miles sewer and furnishing motor-driven centrifugal pump	Committee on Imp.
La., New Orleans	.....June 17.	15-ton hand operated crane, and constructing of drainage canal	F. S. Shields, Sec.
N. Y., Buffalo	.....11 a.m., June 17.	Constructing 9-ft. 6-in. brick trunk sewer	F. G. Ward, Com. Pub. Wks.
S. D., Britton	.....8 p.m., June 18.	Complete sewer system, including sewage treatment plant	G. G. Baker, City Aud.
O., Springfield	.....June 18.	Constructing sanitary sewer	A. E. Ashburner, City Mgr.
Wis., Appleton	.....9 a.m., June 18.	Constructing sewer	E. L. Williams, City Clk.
N. J., Paterson	.....2 p.m., June 19.	Main intercepting sewer	J. S. Gibson, Clk. Passaic Val. Sewerage Comms.
Minn., Crosby	.....June 20.	Storm sewer	Village Clerk.
Wis., Ripon	.....4 p.m., June 22.	Sewers	J. W. Pierce, City Clk.
Conn., West Haven	.....2.30 p.m., June 24.	Constructing 35 miles of vit. pipe sewer, 8-24 ins. (See proposal ad.)	Clyde Potts, 30 Church St., N. Y. City.
Pa., Lebanon	.....5 p.m., June 25.	Constructing sewer	T. R. Crowell, City Engr.
Neb., Norfolk	.....About June 25.	Storm sewer; cost, \$2,000	H. H. Tracy, City Engr.
N. J., Newark	.....2 p.m., June 25.	Constructing Part 9 of main intercepting sewer	Passaic Valley Sew. Comrs.
Minn., Revere	.....8 p.m., June 26.	2,160 ft. 10 to 20-in. combined sanitary & storm sewers	F. B. Grinder, Vil. Recorder.
N. Y., Albany	.....June 29.	Imhoff tank, outfall sewers and drying beds	Board Con. & Supply.
Tenn., Fayetteville	.....2 p.m., June 30.	Sanitary sewer system	Bd. of Aldermen.
La., New Orleans	.....noon, July 30.	Wire and cables for drainage system	F. S. Shields, Sec. Water Bd.
WATER SUPPLY.				
Ky., Seebree	.....June 15.	Water works system	C. H. Ramsey, Mayor.
Mont., Lewistown	.....June 15.	Gravity pipe line	City Clerk.
Md., Crisfield	.....June 15.	Laying about 11,000 ft. 4-6-in. pipe with hydrants, valves, etc.	L. C. Quinn, Mayor.
N. J., Milltown	.....2 p.m., June 15.	Constructing water works, consisting of 4.5 miles c-i pipe, 4 to 10-inch	R. A. Harkins, Boro. Clk.
N. Y., St. Johnsville	.....June 15.	Concrete reservoir with million gallons capacity	Board of Comms.
Pa., Harrisburg	.....3 p.m., June 15.	Laying a 6-in. and 12-in. water pipe	H. F. Bowman, Supt. Pub. S.
Ont., Toronto	.....June 16.	One or more 24,000-gal. centrifugal pumps and engines	Chmn. Board Control.
D. C., Washington	.....2 p.m., June 17.	Installing automatic sprinkler equipment in land office, etc.	L. C. Laylin, Asst. Sec. Int.
Md., Baltimore	.....June 17.	Constructing superstructure for buildings for water department	Board of Awards.
N. C., Washington	.....4 p.m., June 17.	Constructing water works and electric plant	Com. on Imps.
Ia., Burlington	.....June 17.	Dredging and pipe laying for 30-inch c. i. intake pipe	Water Company
Tex., Rusk	.....7.30 p.m., June 17.	Waterworks	J. L. Summers, City Sec.
Minn., Buhl	.....June 17.	12-in. well, 700 ft. deep	F. J. Demel, City Recorder.
Sask., Saskatoon	.....June 20.	Four million gallons centrifugal pump	City Commissioners.
Ark., Clarendon	.....June 24.	Constructing water works	J. W. Hooper, Sec. Bd. Imp.
Kan., Coldwater	.....June 25.	100 H.P. oil engine, 75 K.W. generator, 10,000 gal. fuel oil storage tank, switchboards and other instruments	City Clerk.
N. Y., Sidney	.....about July 1.	Constructing water works, cost \$125,000	Village Clerk.
S. D., Tripp	.....July 15.	Sewers and sewage treatment plant	Dakota Engrg. Co., Mitchell
LIGHTING AND POWER.				
Tex., Ft. Bliss	.....June 15.	Addition to electric lighting system	W. E. Hunt, U. S. A., El Paso.
N. Y., Brooklyn	.....June 15.	Electric equipment of school	Supt. School Bldgs.
O., Columbus	.....June 16.	Cluster lights	Dir. Public Service.
D. C., Washington	.....June 16.	Supplying three electric furnaces, induction motor, 6,000 ft. conductor cable, 148,000 ft. of insulated conductor, etc.	Bureau Accts. & Supplies, Navy Dept.

BIDS, ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
N. C.	Washington	4 p.m., June	17..Electric plant improvements.....	J. B. Fowle, Chr. Com. on Imp.
N. J.	Woodbridge	8 p.m., June	22..Lighting streets with 63 and 25 c.p. lamps for one year..	Commissioners.
Fla.	Punta Gorda	June	30..Fully equipping electric light plant.....	J. F. Corbett, Clk. Bd. Bond Trus.
Man.	Winnipeg	11 a.m., June	30..Switchboard and other apparatus for fire alarm office equipment.....	City Electrician
O.	Mansfield	.....m., July	1..Electric street lights for 10 years.....	O. Hursh, Dir. Pub. Serv.
Ia.	Dubuque	.....July	2..Providing changes in plumbing cond't and wiring system.....	Superv. Arch., Wash., D. C.
Md.	Easton	noon, July	8..Engine, generators and power plant equipment.....	C. H. Henry, Sec. Easton Elec. Commission

FIRE EQUIPMENT.

Ariz.	Phoenix	.....June	15..Three combination chemical and hose motor trucks with equipment.....	W. A. Farish, City Mgr.
D. C.	Washington	10 a.m., June	16..Furnishing quantity of hose.....	Bureau of Supplies, Navy Dept.
N. Y.	Niagara Falls	3 p.m., June	16..Motor tractor for aerial hook and ladder truck.....	T. H. Hogan, City Clerk.
Cal.	Sacramento	.....June	16..Supplying motor propelled chemical engine, pumping engine and hose wagon, runabout, chassis for chemical tanks and fire patrol.....	M. J. Desmond, City Clerk.
N. J.	Plainfield	8.30 p.m., June	17..Four-cylinder triple combination fire engine and hose carrier.....	J. T. McMurray, City Clk.
Alt.	Edmonton	.....June	18..Furnishing one motor combination chemical and hose; 2 motor combination chemical and hose; 1 motor civil service truck; 500 ft. of hose, etc.....	City Comrs.
La.	Washington	8 p.m., June	19..1,000 ft. 2½-in. 3-ply multiple woven fibre fire hose.....	F. P. Martin, Mayor.
Minn.	St. Cloud	3 p.m., June	22..Fire house.....	D. C. Magnuson, City Clk.
La.	Baton Rouge	.....June	25..Furnishing motor combination chemical and hose.....	A. Grouchy, Comr. Pub. Health
Man.	Winnipeg	.....June	30..Switchboard and apparatus for fire alarm.....	Chman. Bd. Control.
Mont.	Missoula	.....July	1..500 feet hose.....	L. E. Harris, City Clerk

BRIDGES.

Wyo.	Sheridan	10 a.m., June	13..Constructing reinforced concrete bridge.....	C. R. Wood, City Engr.
Ind.	South Bend	.....June	15..Constructing reinforced concrete bridge.....	Comrs.
Tex.	Waco	10 a.m., June	15..Bridges and culverts.....	W. T. Lockwood, Co. Aud.
O.	Delaware	noon, June	15..Substructure of bridge.....	W. V. Aldrich, Co. Aud.
N. Y.	Albany	noon, June	15..Constructing viaduct in town of Bethlehem.....	J. A. Bense, State Engr.
Ind.	Liberty	2 p.m., June	16..Constructing concrete bridge.....	G. W. Wray, Aud.
O.	Columbus	2 p.m., June	16..Constructing bridges and culverts.....	J. R. Marker, St. Hwy. Engr.
Wis.	Appleton	9 a.m., June	16..Constructing steel or reinforced concrete bridge.....	E. L. Williams, City Clerk.
O.	Cincinnati	noon, June	19..Substructure and concrete floor for bridge.....	Co. Comrs.
O.	Gilead	.....June	19..Constructing two 82-foot bridges.....	Co. Comms.
Ill.	Aurora	.....June	20..Reinforced concrete bridge.....	Town Clerk.
N. J.	Newton	.....June	22..Girder or Luten reinforced concrete bridge.....	Board of Freeholders.
Kan.	Wichita	.....June	22..Three reinforced concrete bridges.....	E. B. Moore, Co. Engr.
Wis.	Wilson	1 p.m., June	22..Constructing one bridge.....	Board of Supervisors.
Mo.	Independence	.....June	23..Concrete approaches.....	County Comrs.
Mo.	Kansas City	.....June	23..Two reinforced concrete approaches.....	County Court.
N. Y.	New York	11 a.m., June	23..For construction of reinforced concrete Ashokan bridge.....	Comrs. of Wat. Sup. Board
O.	Cincinnati	.....June	26..Concrete bridge.....	County Comrs.

MISCELLANEOUS.

Ill.	Springfield	.....June	15..Erecting buildings and state institutions, also plumbing, heating, etc.....	D. K. Whipp, Fiscal Supv.
Man.	Winnipeg	.....June	15..Street name posts and name plates.....	Chr. Board Control.
R. I.	Providence	2.15 p.m., June	15..Recreation building.....	W. C. Pelkey, City Clk.
Ill.	Chicago	11 a.m., June	15..Furnishing 1,000 cu. yds. of bird's-eye gravel, and also cut stone for foundry building.....	L. E. McGann, Comr. P. S.
Ind.	Ft. Wayne	10 a.m., June	16..Constructing reinforced concrete retaining wall.....	Commissioners.
Ky.	Jackson	3 p.m., June	17..Constructing complete post office. (See Proposal Ad.).....	O. Wenderoth, Supv. Arch., Wash., D. C.
Ill.	Chicago	11 a.m., June	17..Furnishing and delivering fuel oil.....	L. E. McGann, Comr. P. Serv.
Conn.	Stamford	.....June	22..Addition to high school building, to cost \$125,000.....	Board of Selectmen.
Mass.	Boston	3 p.m., June	25..Mechanical equipment of immigration station. (See proposal ad.).....	O. Wentworth, Sup. Arch., Wash., D. C.

STREETS AND ROADS

Athens, Ala.—Limestone has just decided to build more pikes. This will be state aid road, and \$10,000 will be spent on Fayetteville and Athens road, taking it from Athens quite to state line in east part of county.

Birmingham, Ala.—City Commissioner Weatherly has stated that upon completion of First Ave. viaduct, First Ave. would be paved from the east end of viaduct to about 41st St., in Avondale, thus giving probably longest paved street in city.

Gadsden, Ala.—Resolutions calling upon County Commissioners to call election at early date on question of issuing \$300,000 in good roads bonds has been passed.

Courtland, Ala.—A movement is on foot to complete macadam road from Colbert County line, through Lawrence County, to Morgan.

Phoenix, Ariz.—Bids for paving of E. Jefferson St., from First St. to Seventh St., and alley of block 24 have been opened. These figures were submitted: For the paving of E. Jefferson St.: Barber Asphalt Paving Co., \$56,036.68; Arizona Asphalt Paving Co., \$57,433.22; Bryant & Austin, \$56,786.94. For the paving of the alley in block 24: Barber Asphalt Co., \$2,322.43; Arizona Asphalt Co., \$2,381.64; Bryant & Austin, \$2,329.09. Awarding of contract was deferred.

Oroville, Cal.—Bids for paving fourteen blocks of street in business district of Oroville will be opened at special meeting of Board of Trustees to be held on

June 15. Successful bidder will be given 15 days to assemble plant and material and to begin construction work.

Pasadena, Cal.—Proceedings for improvement of Chestnut St. with 6-in. oil-macadam pavement, from Raymond to Marengo Ave., have been inaugurated by Commission.

Stockton, Cal.—Election will probably be held in June for voting on \$266,000 bond issue for street improvements.

Bridgeport, Conn.—Bridgeport is to have a number of finely paved streets before fall arrives if present plans are successfully carried out. Quite deal of work was ordered by City Council. The money for paving was provided for in bond issue of \$200,000 passed at special election of May 16 and in opinion of city officials best type of pavement will be laid in permanent road construction.

Bridgeport, Conn.—Main St., between North Ave. and the Trumbull line, will be paved with warrenite this summer, and it is expected that work will be started very soon.

Dover, Del.—Petitions have been presented for improvement of additional county roads, especially much traveled road from Felton to Hollandville, which has been reported in bad condition.

New Castle, Del.—Members of Finance Committee of City Council have turned over \$30,000 bond issue to be used for street improvements.

New Castle, Del.—Bond Commission will soon advertise for bids for street work. Meeting was held and different materials for street paving discussed.

Manatee, Fla.—By decisive vote of more than five to one, citizens of Mana-

tee decided at election to bond for \$100,000 for improvements of streets and installation of water and sewerage systems.

Bloomington, Ill.—Beecher street, from East to Park St. and Franklin Ave., from Beecher St. to Division St., will be paved this summer.

Galva, Ill.—Contract for brick paving to cost about \$32,000 will be let June 15.

Joliet, Ill.—Vitified brick will be material used for paving of Western Ave.

Fort Wayne, Ind.—County Treasurer J. Herman Bueter has sold stone road bonds as follows: Harkensider road in Pleasant Township, to Hamilton National Bank, \$16,000; Connors road in Pleasant Township, sold to J. F. Wild & Co., Indianapolis, for \$13,840; Rohrbach road in Madison and Marion Townships, sold to German-American National bank.

Kokomo, Ind.—Notice is given that bids will be received at office of the County Treasurer of Howard County, Ind., in Court House at 10 o'clock a. m., June 10, 1914, for purpose of following Series of Free Gravel Road Bonds, described as follows, to wit: D. G. Campbell Rd., No. 5257, Howard Township, 20 bonds at \$153 each, \$3,060; H. K. Johnson Rd., No. 5258, Howard Township, 20 bonds at \$135 each, \$2,700; Clyde Addington Rd., No. 5349, Center, Clay and Harrison, 20 bonds at \$434 each, \$8,680; David Hicks Rd., No. 5406, Clay Township, 20 bonds at \$164 each, \$3,280. T. C. Malaby Rd., No. 5511, Center Township, 20 bonds at \$1,500 each, \$30,000. These bonds are issued for construction of free gravel roads in several townships

named in Howard County. L. Ryan is Treasurer.

Kokomo, Ind.—Petition for resurfacing of West Mulberry St. with asphalt has been filed with members of Board of Works by W. A. Hansell and thirty-one other property owners.

Washington, Ind.—Road election held in Washington township has been carried. Estimated cost of road, which is to be graded and graveled, is \$10,000.

Council Bluffs, Ia.—Nearly mile of boulevard along the Missouri River front between Nathan P. Dodge Memorial Park and Lakeview Park will be constructed this summer, if present plans of Board of Park Commissioners are carried out.

Council Bluffs, Ia.—Paving North Broadway, South Ave. and streets connecting latter with 16th Ave. with concrete will cost city \$68,483.48, according to tabulation made of bid of E. A. Wickham for the work. Table shows bids of E. A. Wickham for entire work to be about \$8,000 lower than next bidder. C. C. Norgaard was next lowest, his total being \$76,553.26, or \$1,105.93 below the next, George F. Hughes. Bid of J. J. Sloan & Co., of Sioux Falls, was highest with total of \$81,866.56. The H. J. Cathro & Co., of Omaha, bid was \$80,369.12. Total cost of paving Broadway, not including creek work, will be \$35,844.38 on estimate made from Wickham's bid. Cost of paving South Ave. alone will be \$24,555.92; of Tostevin St., with curbing and gutter, \$5,087.56; of Graham Ave., with curb and gutter, \$1,684.92; of High St., with curb and gutter, \$1,310.90. It is expected contract will be given to E. A. Wickham when Council completes review of tabulation.

Bangor, Me.—City will contract for 15,000 cubic yards of gravel to be used on streets.

Bangor, Me.—City of Bangor is to do its own street sprinkling this season under direction of board of street engineers, and Murtagh Hughes, contractor who did work last year, is going to sell his equipment to city for \$2,000.

Baltimore, Md.—Commissioners for opening streets will soon be ready to receive bids for another large contract for paving in Annex. Commissioners will submit proposals for Contracts Nos. 133 and 134, which involves paving of 17 streets that have never been paved before, aggregating about 38,000 sq. yds. of sheet asphalt and 4,000 sq. yds. of vitrified brick.

Beverly, Mass.—Order appropriating \$44,000 for reconstruction of Rantoul St. has been finally passed.

Fall River, Mass.—Aldermanic committee on highways has allotted \$35,000 to granite block Hassam paving construction and \$25,000 for curbing, latter being mapped out under old piecemeal plan of parceling out to respective wards.

Lynn, Mass.—Sum of \$4,500 from license fees has been given for street equipment.

Lynn, Mass.—Sum of \$20,000 for new sidewalks and \$25,000 for new paving have been appropriated from license fees.

Pittsfield, Mass.—At joint meeting of finance, highway and fire department committees, orders amounting to nearly \$10,000 were recommended. It was recommended that \$4,000 be taken for repairs in Plunkett St., \$1,500 in Peck's road, \$900 in Swamp road and \$400 in Seymour St.

Menominee, Mich.—Menominee county at special election has voted to continue road building during coming year by approving of \$60,000 bond issue.

St. Joseph, Mich.—Board of Supervisors by unanimous vote has approved form of bond for sale of \$100,000 worth of good roads issue to Farmers & Merchants bank of Benton Harbor.

Duluth, Minn.—Petition has been received for paving of Fifth alley between 21st and 22d Aves. east and another for paving with concrete or crushed rock of alley between Sixth and Seventh Sts. and Ninth and Tenth Aves. east. Paving of First alley between Fifth and Sixth Aves. west has been ordered. The estimated costs are: Concrete, \$1,879.85; brick, \$2,546.83; sandstone, \$3,155.63.

Keewatin, Minn.—This village has mapped out extensive amount of village work for this summer and has started by ordering about \$40,000 worth of paving machinery, including concrete mixer, roller, etc. Village will spend about \$100,000 paving streets and making other improvements. Work will be done by village by 8-hour day labor.

Virginia, Minn.—A big delegation of good roads boosters will go to Duluth to wait on County Board to ask for liberal appropriation for road work in this section, especially on Pike River and In-

ternational road between here and Cook.

Tupelo, Miss.—Board of Supervisors has sold at auction sale \$200,000 Lee County road bonds, bearing 5 per cent. interest, to People's Bank & Trust Co. of this city.

Billings, Mont.—Petitions for five new roads have been presented to Board of County Commissioners. Roads are as follows: Frank R. Clark Rd., in the vicinity of Dry Creek; Ellis R. Pleasant Rd., near Ballantine; Fred W. Awe Rd., near Buckey postoffice; Ed Bolt Rd., on Pompeys Pillar Creek, and Martin F. Connole Rd., near Acton.

Butte, Mont.—The judiciary committee of City Council is considering matter of paving of East Front St. and Arizona St., but came to no decision as to what material should be used or action taken except to advertise for bids before making selection.

Great Falls, Mont.—City Council has ordered three blocks of wood block paving to cost in excess of \$26,000.

Lewiston, Mont.—Purchasing committee of City Council is now considering number of bids for furnishing city with street cleaning apparatus and it is expected that order for sweeper and flusher will be placed shortly.

Melstone, Mont.—At meeting of Council clerk was instructed to advertise for bids for construction of cement sidewalks for Melstone. About 20 blocks will be built. Specifications will be on file with clerk on June 1 and bids will be opened June 9. Parkinson & Renshaw, engineers of Roundup, were engaged to draw specifications and to supervise work of construction.

Grand Island, Neb.—Bond issue of \$15,000 for paving district No. 11 has been sold.

Bayonne, N. J.—City is to be provided with new street signs and bids for furnishing them will be received at next meeting of Council.

Millville, N. J.—Bids will be received until 3.30 p. m. June 12 by Board of Commissioners of City of Millville for purchase of improvement bonds of city of par value of \$79,000, of which \$10,000 will be 5 per cent. road bonds and \$36,000 will be 4½ per cent. street improvement bonds.

Passaic, N. J.—Paving of Main St. with granite block is being considered.

Perth Amboy, N. J.—Board of Aldermen has decided to have improved granite blocks laid on hill section of Amboy Ave.

Perth Amboy, N. J.—New Brunswick Ave., from Lehigh Valley railroad tracks to Convery Place, is to be paved with either bricks or asphalt blocks and Amboy Ave., between New Brunswick Ave. and northerly line of St. Mary's R. C. cemetery, is to be permanently paved with asphalt blocks and granite block, according to action taken by Board of Aldermen.

Plainfield, N. J.—For purpose of permanently improving Girard Ave., Emerson Ave., Monroe Ave., West Fourth St., Ravine road, Berkeley Ave., and other streets, Common Council has passed ordinance authorizing bond issue of \$17,000 to defray cost of making this improvement.

Brooklyn, N. Y.—Board of Estimate and Apportionment has granted authorization for public improvements, including highways, sidewalks and sewers in Brooklyn and Queens, to be repaid by assessment upon property benefited, but work being paid for in first instance by city. There are 24 final authorizations for Brooklyn, total estimated cost of which is \$109,900, and 14 preliminary, to cost \$76,000, a grand total for this borough of \$185,900. There are 6 final authorizations for Queens, to cost \$57,900, and 12 preliminaries, to cost \$83,900; grand total for that borough, \$141,800.

Mendon, N. Y.—Town may build its own gravel road, for which bids have been advertised. County Superintendent J. Y. McClintock, Supervisors William E. Porter and several Mendon residents have conferred with Highway Engineer Perry Filkins with regard to Rush-Mendon Part 2 highway, which will be 3.85 miles long. Estimated cost is \$19,000.

Phelps, N. Y.—Board of Village Trustees has voted to hold special election in Village Hall on June 16, for purpose of submitting proposition to bond village for \$21,000 in addition to \$34,000 already appropriated to defray village's share of brick pavement the entire length of Main St.

Port Jervis, N. Y.—Plans and specifications for paving of Jersey Ave. have been adopted, and clerk will advertise for bids to be received on June 15.

Schenectady, N. Y.—Bids for patching of Front St. are as follows: 500 sq. yds.

asphalt pavement, J. F. Shanley Co., \$2.15; Union Paving Co., \$2.04; 1,070 sq. yds. brick pavement, Shanley, \$2.50; Union, \$2.30; 300 sq. yds. old brick relaid, Shanley, \$2; Union, \$1.30; 1,000 lin. ft. bluestone curb, Shanley, 90 cts.; Union, 65 cts.; 100 lin. ft. curb reset, Shanley, 60 cts.; Union, 30 cts. Contract will undoubtedly be awarded to low bidder. Bids will be opened shortly for construction of concrete sidewalks in Campbell Ave., Guilerland Ave., Bedford Rd., Lenox Rd., and McClellan St., approximately 11,000 ft. of concrete sidewalks and 200 ft. of roadway.

Dayton, O.—County Commissioners have adopted resolutions for brick paving improvement on Salem pike for distance of 2 1-3 miles from corporation line to point near Fort McKinley. Estimated cost of the work, contract for which will be let June 16, will be \$45,000. Paving is to be completed by first of November.

Marietta, O.—Two miles and one-half of concrete road will be built in very near future up Muskingum Drive, at approximate cost of \$31,000.

Newark, O.—Amended plans for paving of Buena Vista St. have been submitted by City Engineer Wells, with roadway 35 ft. wide, estimating cost per ft. front to be \$3.17½; for one 30 ft. wide, \$2.91½; for one 25 ft. wide, \$2.50.

Sandusky, O.—Notice of acceptance of plans and specifications for construction of one mile of tar bound macadam pike in Erie County as prepared by county surveyor some time ago, has been received from State Highway Commission and bids for road building, grading, surfacing and paving would be received June 16. Estimated cost of the road, known as intercounty highway No. 4 is \$5,400. Of this amount state will furnish half while Erie County will contribute the remaining \$2,700.

Poteau, Okla.—Date for voting on \$154,000 bonds for purpose of building good roads in LeFlore County has been postponed from June 27 to 30.

Carlton, Ore.—At special meeting of City Council final ordinance covering improvement of streets with hard surface was passed and bids for work will be advertised for at once. This will embrace about 1½ miles of paving, and will give hard-surfaced roadway to city limits on all of roads entering this place. Total cost of improvement is estimated at about \$50,000.

Eugene, Ore.—Plan is being discussed for paving streets in the future with wooden blocks manufactured at Eugene.

Erie, Pa.—Ordinance has been adopted providing for construction of nine (9) in. diameter tile pipe lateral sanitary sewer in 25th St., from the centre of Raspberry St. east 610 ft., more or less, together with necessary house connections. M. J. Henry is Clerk, City Council.

Wilkes Barre, Pa.—Repairs to street asphalt paving has become such an item of expense in this city that Superintendent Charles N. Loveland, of the Department of Streets, is considering advisability of having city install asphalt plant of its own and in future do its own repair work. He has instructed City Engineer B. K. Finch to get data as to cost of plant in order that belief of superintendent may be either verified or disproved.

Cranston, R. I.—Cranston City Council's highway committee has decided that money to be had for highway work this year will amount to \$4,200 for each of First, Second and Third Wards, and \$4,000 for Fourth Ward. It is conceded that these sums will really do only small portion of work that ought to be done. Total highway appropriation was \$27,000, and of this sum approximately \$10,000 will be needed for other purposes, including purchase of tools and repairs, etc., so that \$17,000 is what committee has to distribute.

Providence, R. I.—Resolution providing for bitulthic paving on Public St., from Broad St. to Elmwood Ave., will be presented in Common Council with recommendations of passage by committee on highways. Distance to be so paved is considerable, and is in section of Public St. which is heavily traveled.

Woonsocket, R. I.—Mayor Daignault has affixed his signature to several important resolutions. He approved resolution appropriating \$55,000 for paving of North Main St. and part of Winter St., and construction of surface water drains in those highways.

Knoxville, Tenn.—Asphalt will be used in repaving of Gay St. on that portion of street to be paved south of Commerce Ave., and sandstone blocks will be used north of that avenue to viaduct across Southern Railway.

Corpus Christi, Tex.—By vote of 227 for and but 2 against voters of San Patricio County road district No. 1 have authorized good roads bond issue of \$50,000. Towns in district are Gregory, Taft and Portland. Major portion of proceeds will be used in building approach on San Patricio side to causeway across Nueces Bay.

El Paso, Tex.—In response to advertising for bids on paving North Kansas St. from Blacker to Cincinnati Sts., only one bid was submitted. This was by Texas Bitulithic Co., for \$1.46 per square yard for light standard bitulithic pavement. Bid was referred to finance committee.

Marshall, Tex.—Harrison County Road bond issue of \$300,000 has been sold to firm of Weil-Roth & Co., of Cincinnati, Ohio.

Pecos, Tex.—H. N. McKellar, County Judge of Reeves County, has announced that bids will be received for issue of \$100,000 of bonds of Reeves County Road District No. 1, voted Jan. 24.

San Antonio, Tex.—Council has decided to pave east side of Military Plaza, Lakeview Ave. and Trinity St.

San Antonio, Tex.—Largest single street paving contract ever awarded in south has been authorized by City Council for paving of 25 miles of streets in this city at cost of \$1,650,000. This is part of work under recent bond issue of \$3,450,000 for civic improvements.

Temple, Tex.—Engineering and contracting firms from various portions of country are here inspecting plans and specifications for construction of 80 miles of graveled roads in Road District No. 5, of Bell County, all of which radiate from Temple, and will be built with proceeds of bond issue of \$600,000 voted several months ago. Bids will be opened at Belton on June 15 and awards made soon thereafter.

Logan, Utah.—Bids have been opened by city commissioners for street paving, from following bidders: Ryberg Bros., Salt Lake; J. E. Wilson, Jr., Logan; G. H. Nash & Co., Missoula, Mont.; Parrott Bros. & Thompson Co., Salt Lake; Giles-Britten Co., Salt Lake; Nelson, Worley & Nelson, Logan; Linch Construction Co., Salt Lake. It appears that Parrott Bros., Ryberg Bros. and Nelson, Worley & Nelson are lowest bidders, but board of commissioners opened bids and took them under advisement. Job will cost nearly \$100,000.

Ogden, Utah.—Bids for paving with asphalt of 25th St., from Washington to Wall Ave. and Wall Ave., from 24th to 25th, have been referred to city engineer by city board for examination. Following bids were offered: J. P. O'Neill Co., \$36,771.67; P. J. Moran Co., Salt Lake, \$36,278.96; G. A. Heman, Salt Lake, \$35,004.60.

Salt Lake City, Utah.—By action of City Commission Utah rock asphalt was specified as paving for Twelfth South between Ninth East and Eleventh East. Contract for paving will be advertised within next few days.

CONTRACTS AWARDED.

Birmingham, Ala.—By City Commission contract for paving Eulat St. from Magnolia Ave. to Rose Ave. to J. L. Mullarkey, Birmingham, Ala., for \$987.50, and for grading and macadamizing 41st St. from 10th Ave. to Central of Georgia right of way to Martin Transfer and Contracting Co. for \$4,747.60.

Chicago, Ill.—By Board of Local Improvements for constructing concrete curb, grading and paving with granite blocks on 2 ins. of sand and 6 ins. of Portland cement concrete, joints filled with gravel and coal tar, surface dressed with 1/4 in. gravel, roadways of the Public Alleys between West Randolph St., West Washington Blvd., North Peoria St. and North Sangamon St., to John Dillon, and similar work on other streets to Schmidt Const. Co., Contract Paving Co., and James A. Sackley Co. G. A. Schilling is President of Board.

Joliet, Ill.—Contract for paving east and west alley from Chicago to Scott St. between Cass and Webster Sts. has been let to W. B. Curtis on his bid of \$1,322, the Joliet Embankment Co.'s bid being \$1,390.30.

Fort Wayne, Ind.—Contract for paving South Calhoun St., from Rudisill Blvd. to McKinnie Ave., has been signed and Grace Construction Co. will take lien for \$6,000 against Decatur Interurban line to pay for that company's portion of work.

Indianapolis, Ind.—For paving with asphalt Churchman Ave. by Bd. Pub. Wks. to Marion County Construction Co., 1600 S. West St., at \$20,651.

Lafayette, Ind.—Bids for cement sidewalks on Kossuth St. have been received

from H. H. Budge and W. M. Jackson, Lafayette, Ind., former's bid being 47 1/2 cts. and latter 47 cts. They were referred to city engineer.

Muncie, Ind.—By committee for paving of Jefferson St., from Jackson to Adams, William Birch, brick paving, \$1.90 per sq. yd.; creosote blocks, \$2.76 per sq. yd.; contract awarded with temporary order for brick. Sidewalk on Eighth St., from Madison to Plum, Lewis Peck, 61 1/2 cts. per lin. ft.; William Birch, 66 1/2 cts. per lin. ft.; contract awarded to Peck. Sidewalk on Elm St., from 12th to 16th, Lewis Peck, 60 cts. per lin. ft.; William Birch, 62 1/2 cts. per lin. ft.; contract awarded to Peck.

New Castle, Ind.—Firm of Harding & Slattery, of Crawfordsville, has been awarded contract for construction of 3-mile road in Fall Creek Township by commissioners. Their bid was for \$52,000. Other bids were as follows: Boots & Gant, Greenfield, \$53,000; Tripper & Son, Peru, \$55,000; L. B. Barris, Rushville, \$54,000; Connor & Sherry, Connersville, \$54,445, and William Coin, Frankfort, \$56,299.85.

Peru, Ind.—To James Burke contract for improvement of Loveland Ave., at \$1,023.08.

Portland, Ind.—County commissioners have received bids for construction of B. E. Foling road in Wayne Township. Road runs from cemetery west to township line, and is about a mile and three-quarters long. Estimate of cost was more than \$10,000, but contract was awarded to Lowery & Mannix at their bid of \$6,980.

Belmont, La.—For erecting highway from Belmont south to W. B. Kennard, Many, La., at \$8,953. C. C. Sandoz is Secy. Highway Dept., New Orleans.

Asbury Park, N. J.—For constructing state road from Pole Tavern to Elmer to J. L. Le Compte, Lakewood, at \$13,629.

Boston, Mass.—By Department of Public Works, for paving with 2-in. bituminous surface, Marlborough St., to James Doherty, at \$22,997. Other bids as follows: Warren Bros. Co., \$23,067, and Central Construction Co., \$23,347. Contract for improving Old Colony Ave., from Hyde and Mt. Vernon Sts., has been awarded to James Doherty, at \$13,461.

St. Paul, Minn.—Bids of Magnolia Petroleum Co. for furnishing about 460 tons of Mexican asphalt for paving of Portland and Holly Aves. and Market St. have been accepted by council after hearing report of City Chemist Roehrich that asphalt is up to specifications. Price is \$18.60 a ton.

Vicksburg, Miss.—By Board of Supervisors for first 16 miles of principal county roads to Owens Construction Co., of Meridian, at \$96,259.

Keene, N. H.—For paving 9,000 sq. yds. to Hugh J. McGuire, Milbury St., Worcester, Mass., at \$27,000.

Dunellen, N. J.—Contract for laying concrete crosswalks has been awarded to W. W. Smalley at 34 cts. per sq. ft. John Fedderman's, only other bidder, price was 40 cts. per sq. ft.

New Brunswick, N. J.—The Monmouth Contracting Co., of Monmouth Junction, was low on bids for Applegarth-Clarksburg Rd., in Monroe Township, with \$3,906. Other bids were: Citizens' Contracting Co., Trenton, \$5,090; Harry N. Scott Contracting Co., Cranbury, \$4,510.50; John Quinlan, South Amboy, \$4,369.80. Contract will be awarded later.

Newbury, N. Y.—By City Council for paving of Quassalek bridge with Mack brick to Abner M. Harper, Inc., for \$3,379.06.

New York, N. Y.—To Clancy & Nuhn Construction Co., at \$10,764 for improving Newton Road from 13th to Jackson Ave., and to Public Works Construction Co., at \$42,451, for improving Ditmars Ave., from Astoria St. to Frigate St.

Rochester, N. Y.—By Board of Contract and Supply to Ribstein-Holter Co., at \$11,236.25, for paving Marla, Hixon and Carl Sts. with brick.

Columbus, O.—By State Highway Commissioner for reconstruction of National Pike through portions of Licking and Muskingum Counties to H. E. Culbertson Co., of Cleveland, at \$436,017.

Columbus, O.—Following roads were sold on June 2: Defiance County—Hicks-ville-Defiance Road, conc. & macadam, 1. 6.03 mi.; est. cost mac., \$53,951.05; conc., \$56,138.51; award withheld. Gallia County—Ohio River Road, brick, 1. 0.91 mi.; est. cost, \$14,660.30; awarded to Jones & Miller, Patriot, O., \$14,075. Guernsey County—Steubenville-Cambridge Road, conc., 1. 1 mi.; est. cost, \$14,585.12; awarded to Duss, Morehead & Morehead, Cambridge, O., \$14,549.00. Hardin County—Kenton-Forest Road, wbm, 1.

0.28 miles; estimate cost, \$1,834.70; awarded to the Basil Lunsford Co., Pedro, O., \$1,730. Huron County—Oberlin-Norwalk Road, conc., 1. 1.01 mi.; est. cost, \$15,874.25; awarded to Edmund Burke, Franklin, O., \$14,989. Huron County—Oberlin-Norwalk Road, conc., 1. 2.58 mi.; est. cost, \$38,819.75; awarded to Edmund Burke, Franklin, O., \$35,799. Huron County—Bellevue-Norwalk Road, conc., 1. 1.63 mi.; est. cost, \$23,872.17; awarded to the Modern Construction Co., Fremont, O., \$22,872. Montgomery County—Cincinnati-Dayton Road, brick, 1. 2.49 mi.; est. cost, \$45,842.11; awarded to Schwank & McIntyre, Dayton, O., \$43,000. Paulding County—Payne-Hicks-ville Road, conc., 1. 0.56 mi.; est. cost, \$7,820.75; awarded to Clenner & Johnson, Hicks-ville, O., \$7,658. Trumbull County—Niles-Ashtabula Road, conc., 1. 2.82 mi.; est. cost, \$22,265.25; no bids. Williams County—Bryan-Defiance Road, W.B.M., 1. 1.01 mi.; est. cost, \$8,596.08; no bids. Belmont County—National Road, Sec. No. 3, brick, 1. 16.62 mi.; est. cost roadway, \$341,498.74; est. cost masonry, \$76,757; bid on roadway, \$341,498; bid on masonry, etc., \$76,756; force account work, 20 per cent.; awarded to the Adams Bros. Cont. Co., Zanesville, O.

Columbus, O.—A long list of contracts for street improvements have been awarded to Andrews Asphalt Paving Co. by City Board of Control. They are for following streets and prices: Wrexham Ave., from Doren St. to Sullivan Ave., \$9,847.50; Tuler St., Woodruff to Norwick Aves., \$7,399; Tompkins St., Summit to Fourth Sts., \$5,977; Seymour Ave., Main St. to Livingston Ave., \$28,797.10; Rich St., High St. to Scioto River, \$13,869.10; Lathrop St., Livingston Ave. to Seymour Ave., \$5,527.75; Gilbert St., Main to Mound St., \$2,454.25. A. G. Pugh, Columbus, O., was given contract for paving with asphalt Cleveland Ave., from Columbus, Shawnee and Hocking tracks to north corporation line for \$43,543.50.

Lowellville, Ohio.—To Campbell Bros. Co., Youngstown, for constructing Sec. 1 of Youngstown-New Castle Road, at \$18,800. W. J. Maurice is Clk.

Youngstown, O.—By Board of Control following street improvement contracts: Elm St. paving, R. C. Shook, \$3,446; Jackson St. paving, Miller & Irwin, \$6,308.10; Knox St. grading and sewerage, Charles Harris, \$1,282.96; Carlyle St. grading, R. C. Shook, \$1,008; Morse St. grading, James McCarron, \$5,182.50; Byron St. paving, A. O'Horo, \$13,822.20; Kensington Ave. paving, P. & P. J. Grady, \$3,917.80; Blaine Av. paving, A. O'Horo, \$3,263.70; paving 300 sq. yds. in Deed St., William Hayes, \$496.

Whitehouse, O.—To Johnson & Ritz of Napoleon, O., contract at \$12,764.90, for paving with concrete and stone curb. Smith & Boulay Co. are civil engrs., Toledo, O.

Altoona, Pa.—For paving of 16 Ninth ward blocks to Bell-Bockel Co., at \$2.21 per yd.

Clearfield, Pa.—By State Highway Dept. to Geo. I. Thompson & Co., Clearfield, Pa., Clearfield, at \$12,007.54 for 1,963 ft. brick block paving, at Clearfield.

Curwensville, Pa.—By State Highway Dept. to Curwensville Const. Co., Curwensville, Pa., at \$30,099.13, for 6,045 ft. brick block paving.

Erie, Pa.—To John McCormack & Son contract for paving Liberty St. with asphalt from 24th to 26th St.

Franklin, Pa.—Council has opened bids for brick for repaving Liberty St. and council has adopted Bessemer brick, it being offered at lowest price, \$19.25 per thousand net. Bids follow: Clearfield Brick Mfg. Co., \$21 per thousand; Bessemer Limestone Co., \$19.75 per thousand, with a discount of 50 cents, \$19.25 net; Standard Firebrick Co., \$19.50 per thousand; Mack Mfg. Co., \$20.75 per thousand; Patterson Clay Products Co., Clearfield, Pa., \$23 per thousand; Metropolitan Paving Brick Co., \$21.50 per thousand, discount of 50 cents, \$21 net; Pennsylvania Clay Co., \$21.50 per thousand, discount of 2 per cent., \$21.11 net; Porter National Brick Co., \$19.65.

Fort Worth, Tex.—By County Commissioners contract for graveling approach to North Main St. viaduct to S. C. Cunningham for \$935, amount to be laid being 1,050 cu. yds. Other bidders were: L. J. Hawkins at 79 cts. a yd.; J. F. Wills at 90 cts., and W. F. Lowry at 89 cts.

Ogden, Utah.—The Lynch Construction Co. being only bidder for building of curb and gutter on Van Buren Ave., matter was taken under advisement. Company's bid was \$2,571.37.

Manti, Utah.—Bids for cement paving of sidewalk around public square have been received from three different companies, L. P. Miller securing the contract. Following are bids received: Olsen Bros. (Fairview), \$789.50; Carlson Bros., \$709; L. P. Miller, \$684.50.

Wytheville, Va.—By County Comrs. to J. K. Warden, Pulaski, for constructing about 4 miles of macadam road between Farmers Store and Laswell, Wythe County. C. C. Tate is Co. Clk.

Parkersburg, W. Va.—Following contracts for street paving have been awarded: Otto Lehman, 7th St., from Park Ave. to city limits, at \$25,308; C. Kennedy & Son, parts of 12th St., George St., William St., 13th St. and 19th St., at \$1,877, \$1,665, \$1,523, \$3,932 and \$17,962, respectively.

Seattle, Wash.—City Engineer Dimock recommends awarding contracts to low bidders as follows: Alley, block 35, Capitol Hill Addition, Div. 5, paving, W. F. Meisner, \$2,857.05; alley, between 11th and 12th Aves. South and Atlantic and Massachusetts Sts., paving, Krough & Jessen, \$2,847.

Tacoma, Wash.—By county commissioners to Independent Asphalt Pav. Co., contract for paving 2½ miles of roadway between Puyallup and Alderton for \$34,800. Other bidders were: Joseph Watters, \$39,968; Washington Paving Co., \$41,172.98. Bids on warrenite were submitted by the Washington Paving Co. at \$49,011.68 and by Watters at \$45,000. Money will come from state permanent highway fund.

Richland Center, Wis.—For paving Church St. with cement by City Council to Geo. Welch, Beloit, at \$10,680.

SEWERAGE

Camp Hill, Ala.—City may award contract in July, for construction of about 1 mile of 19-in., 2 miles of 8-in., ½ mile of 12-in. and 2 miles of 8-in., vitrified sewers, including about 50 manholes. Edgar B. Kay, Tuscaloosa, Ala., is Engr.

Tempe, Ariz.—At special meeting of Common Council of Tempe clerk was authorized to advertise sale of \$30,000 bonds for new sewerage system, bids to be received by town clerk up to 8 p. m., June 11.

Stockton, Cal.—Construction of 6-in. vitrified clay pipe sewers in various streets has been authorized. G. W. Langford is Superintendent of Streets.

Stockton, Cal.—H. E. Compton, City Engineer, has prepared modified plan for rebuilding and enlarging of present sewer system. Estimated cost, \$375,000. Civil Engineer C. E. Grunsky, of San Francisco, has also prepared plans for system estimated to cost about \$575,000.

Stamford, Conn.—There is possibility that the committee which has been considering matter of sewage-reduction plant will have report to present to next meeting of Common Council. Estimates are being obtained from number of concerns which make specialty of putting in sewage-reduction plants of type proposed for Stamford.

Florida, Fla.—On 15th day of June citizens of Florida will vote on question of issuing bonds to amount of \$16,000 for purpose of extending, enlarging, improving, repairing and securing to city more complete use of and enlargement of sewer system and water works plant. It is intention of city to install new pump at pumping station.

Manatee, Fla.—Citizens have voted in favor of bonds for installation of sewerage and water systems.

Galva, Ill.—Public hearing will be given June 13 on sewer extensions to cost \$14,700.

Mt. Sterling, Ill.—New sewer company has completed its organization with W. T. Purcell as president. It is intention of company to construct sewer system over about two-thirds of town, subscriptions have been received for that purpose. After sewer is completed, it will be turned over to city.

Creston, Ia.—City is contemplating construction of about 700 ft. of 8-in. and 1,600 ft. of 16-in. sewers. Theodore S. De Lay is City Engr.

Des Moines, Ia.—Construction of new northwest sewer system, which it is estimated will cost \$300,000, has been authorized by Council. Fred N. Carss is City Engineer.

Baton Rouge, La.—Preliminary survey of city has been started by City Engineer Mundinger for proposed installation of new sewerage to cover about seven or eight miles.

Harbor Beach, Mich.—Arrangements have been completed by Engineer R. W. Roberts for general sewer system, estimated to cost about \$30,000.

Traverse City, Mich.—City Commission will submit to voters question of bonding in sum of \$90,000 for trunk sewer, pumping station, sewage disposal plant and filtration plant. Election will be held in July.

Camden, N. J.—City will construct following sewers or drains in and along S. 27th St., 250 ft. from 27th and Mickle Sts.; Sheridan St., from Mt. Ephraim Ave. to Tenth St., and Tenth St., from Sheridan St. to Jackson St., and Liberty St., from Sixth St. to W. J. & S. S. R. R.; Ferry Ave., from Line Ditch to Atlantic Ave., and Atlantic Ave., from Ferry Ave. to Philadelphia and Atlantic City R. R., and from Ferry Ave. to Front St. A. L. Sayers is St. Comr.

Elizabeth, N. J.—Ordinance has been adopted for sewer in Chestnut St.

Millville, N. J.—Bids will be received until 3.30 p. m., June 12, by Board of Commissioners for purchase of Impt. bonds in sum of \$79,000, of which \$33,000 are for general improvements, as follows: \$19,000 drainage bonds, \$3,000 sewer purification bonds, \$2,000 fire department bonds series 1, \$5,000 fire department bonds series 2A, \$1,000 fire department bonds series 2B, \$3,000 city hall bonds.

Oaklyn, N. J.—The Oaklyn Borough Council has passed on first reading ordinance providing storm-water sewers.

Trenton, N. J.—Ordinances have been adopted for construction of Sewer No. 600 in Indiana Ave. and Sewer No. 598 in Paul Ave. Frank Thompson is City Clerk.

Dunkirk, N. Y.—By resolution of Councilman Vosburg, Council declared its intention to lay and construct sewer in and along center of Seal St., beginning at Central Ave. and running easterly to west line of Lion St., said sewer to be of 8 in. inside diameter, and to be built in accordance with plan and profile to be prepared by city engineer, and city clerk was directed to advertise same with notice to all concerned that Council will hear objections on June 16.

Wilmington, N. C.—Board of Aldermen of Weightville Beach have decided to begin immediately installation of system of septic tanks at beach to take care of sewerage disposal.

Franklin, Pa.—It has been voted to advertise for bids for sewer on Buffalo St., between Third and Fourth.

Lebanon, Pa.—Bids will be readvertised for construction of North Side House Sanitary sewer contract.

Meadville, Pa.—City is getting ready to advertise for bids for putting of sewer on Willow St.

York, Pa.—The construction of outfall sewer for sanitary sewage system is provided by ordinance passed finally by City Council. Cost of it will come out of \$200,000 loan.

Allendale, S. C.—See "Water Supply."

Nashville, Tenn.—Bill has been passed appropriating \$6,700 for constructing 48-in. brick trunk sewer in alley 907 and private property from west of 23d Ave. to 25th Ave.

CONTRACTS AWARDED.

Alton, Ill.—By Board of Local Improvements for construction of sewers in Sanitary Sewer Dist. No. 2 to Charles E. Van Wormer, and for sewers in Mill and Summit Sts. to Arnold Construction Co.

Chicago, Ill.—By Board of Local Improvements for adjusting sewer manholes and catch basins, constructing and connecting catch basin inlets, constructing new brick catch basins complete, constructing a granite concrete combined curb and gutter on cinders or sand, grading and paving with asphalt on 6 ins. of Portland cement concrete, swept with natural hydraulic cement, the roadway of West Adams St., to Barber Asphalt Paving Co.; also similar work to American Asphalt Paving Co., F. P. McCormick, R. F. Conway Co., J. A. McGarry Co., Ryan Co., Alex. N. Todd, Calumet Coal & Teaming Co., and Ready & Callaghan Coal Co. G. A. Schilling is Pres. of Bd.

Georgetown, Ill.—To Carson Payson, of Danville, Ill., at \$76,420, for installation of proposed sewer system. Other bidders as follows: Alexander R. Todd, Chicago, \$78,327; Public Service Co., Omaha, Neb., \$82,999; Jacob Althouse & Co., St. Louis, Mo., \$82,980.

Lafayette, Ind.—To William F. Frey contract for construction of Morley and Roberts St. sewer.

Laporte, Ind.—For construction of Gropp ditch to Gustav Holquist at \$875.

Middletown, Ind.—Minnick Construction Co. of Newcastle has received con-

tract to build 2½ miles of sewer in Middletown. Sewer will cost \$15,000.

Muncie, Ind.—By members of committee following contracts: 7th St. sewer, Con Delaney, \$1,237.87; William Birch, \$1,014.76; contract awarded to William Birch. High St. sewer No. 5, William Birch, \$1,608; Con Delaney, \$1,784.50; contract awarded to Birch.

Newcastle, Ind.—To Minnick Const. Co., of Newcastle, contract to build 2½ miles of sewer in Middletown. Sewer will cost \$15,000.

Sioux City, Ia.—To Cady & Savonelle, 1312 24th St., for 1,100 ft. 8-in. pipe sanitary sewer in Virginia St.

Swampscott, Mass.—By Board of Water and Sewer Commissioners for construction of 625 ft. of sewer across private land to Redington St. and 200 ft. of sewer in Greenwood Ave., to James T. Lyons, Swampscott, Mass., being lowest bidder.

Zumbro Falls, Minn.—For constructing sewer system to Wm. C. Fraser, St. Paul, as follows: 558 ft. 6-in. pipe sewer, 72½ cts.; 1,455 ft. 8-in., 82½ cts.; 535 ft. 10-in., \$1; 6 manholes, each \$52; rock excavation, per cu. yd., \$5.

Billings, Mont.—Contracts for installation of sewers in three districts have been awarded. H. J. Cathroe of Omaha, with bid of \$16,000, was awarded contract in district 115, which lies west of North 32d Ave. and north of Grand Ave. E. Lindstrom was lowest bidder in both other districts. He will install sewers in district 112, which lies between North 23d and North 24th Sts. from 6th to 9th Aves. north, and in district 114, which extends from 1st to 4th Sts. west between Alderson and Grand Aves. His bid for first district was \$1,523 and for second \$2,334.30.

Brighton, N. Y.—For constructing sewer system by sewer commissioners of District No. 1, to Nicola Desiderio, 47 Ward St., Rochester, at \$32,128.

Dunkirk, N. Y.—For construction of the sewer in Newton St. from Lion St. to Washington Ave. and connecting with sewer in that street to John M. Hackett, former city engineer, at \$1,253.65. Other bidders and their figures were: Peter B. Colgan, \$1,315.47; James McNamara, Dunkirk, N. Y., \$1,323.75, and J. B. Goggin, \$1,330.46.

Schenectady, N. Y.—Low bids of Kehoe & Bisset, of this city, won for that firm big contracts for surface and sanitary sewers in number of streets in which seven local firms bid. Bids opened were: Sanitary sewers—John L. Nolan and R. A. McCauley, \$7,738.50; W. D. Goodale, \$6,222.27; Kalteaux and De Nallo, \$7,840.48; Kehoe and Bisset, \$5,680.61; John Allen, \$6,958.01; T. R. Crane, \$7,176.10; Kellam & Shaffer Co., \$8,449.23. Surface water sewers—W. D. Goodale, \$6,965.84; Kalteaux & DeNallo, \$8,309.54; Kehoe & Bisset, \$6,585; John Allen, \$8,672.90; T. R. Crane, Schenectady, N. Y., \$8,449.23, and Kellam & Shaffer Company, Schenectady, N. Y., \$7,271.07.

Yonkers, N. Y.—By Board of Contract & Supply to Fred E. Gross & Son for laying house and storm water sewer in Lockwood Ave., and sewer in Chase Ave., from Wilson Place to Greenvale Ave., at \$49,371.

Akron, O.—To Kilby Mfg. Co., at \$42,265, by Council, for furnishing equipment for proposed garbage disposal plant.

Canton, Ohio.—For constructing sewage treatment plant to R. H. Evans & Co., Columbus, and O. & E. J. Landor, Canton, at \$249,403. Other bids as follows: John T. Walbridge Engineering Co., Chicago, Ill., \$281,981; the J. C. De Vine Co., Alliance, \$251,721; Ule & L. De Wensohn, Kent, \$267,217; Municipal Engineering & Construction Co., Chattanooga, \$256,795. Z. W. Kent is Dir. of Pub. Service.

Dennison, O.—For constructing disposal plant to Jones Constr. Co., Mt. Vernon, at \$21,500.

Bristow, Okla.—For sanitary main and lateral sewers, to J. S. Terry Constr. Co., Poteau, at \$16,081. Next lowest bidders were: Fritts & Smedley, Muskogee, \$16,142; Derr & Houston, Oklahoma City, Okla., \$16,740; W. T. Power, Guthrie, \$17,019. Extensions will also be constructed and work will amount to approximately \$35,000.

York, Pa.—Contracts have been awarded for sewers by City Council, as follows: Sanitary sewer laterals to Bruno Pizzimento, Seneca Falls, N. Y., \$4,008.43; storm water sewer extensions on West College Ave., East King St. and East Mason alley, G. W. Ensign, Inc., Harrisburg, Pa., \$2,385.53; storm water sewer extensions on South Cherry St., East Church alley, West Cottage Pl., Glen alley and West King St., to General Supply & Constr. Co., York, at \$19,423.67.

Lancaster, S. C.—Contract for waterworks extension and installation of complete sewerage system for Lancaster, Sewerage Committee, together with City Council, have awarded both contracts to Dysard Construction Co., of Atlanta, whose bids were: For sewerage, \$28,576; for waterworks extension, \$7,989. This does not include two small tanks and one large one, which, according to engineer's estimate, will cost \$14,000. The Dysard Co. were lowest bidders.

Grand Rapids, Wis.—For constructing sewers in various streets by Board of Public Works to Russell Construction Co., Superior, Wis. L. Stevens is City Engr.

Milwaukee, Wis.—Frank Luenzmann has been given contract by sewerage commission for construction of seven buildings and septic tanks which will constitute testing station on Jones Island. He will receive \$23,000. Tests will be made here of the character of sewage and best means of disposal, and on result will depend character of permanent sewerage system and settling tanks. T. C. Hatton is Ch. Engr. Sewage Comm.

Two Harbors, Wis.—For various sewer improvements by Board of Public Works to Walter O. Bahr, Manitowoc, at \$32,275.

St. Lambert, Que.—By Town Council for installing storm and sanitary sewers on 8th St. to Edmund Belanger, Montreal, at \$69,081.

WATER SUPPLY

Girard, Ala.—At election held in Phenix City to authorize issue of \$20,000 bonds for waterworks improvement result was almost unanimous for the issue.

Phoenix City, Ala.—Citizens have voted \$15,000 in bonds for water works improvements.

Sacramento, Cal.—Sale of \$18,000 worth of city water mains extension bonds has been made by city to Wright & Kimbrough. Pipes will be placed in Wright & Kimbrough Tract No. 29.

Dade City, Fla.—Council has called special election on June 23 to vote on question of bonding city for \$26,500, of which \$20,000 is for installing municipal water system and \$6,500 for sewer main and septic tank.

Manatee, Fla.—Citizens have voted in favor of bonds for installation of water and sewage systems.

New York City, N. Y.—Bids were opened May 12 by Bd. Water Supply for Contract 88, construction of part of Richmond conduit, a portion of Catskill Aqueduct, in Boro. of Richmond, and contract was awarded to: (1) Beaver Eng. & Contracting Co., 51 Chambers St., \$70,187. Other bids as follows: (2) Fred. N. Lewis, 411 Manhattan Ave., \$74,127; (3) Joseph Johnson's Sons, West New Brighton, \$77,925; (4) Soraci Contr. Co., 170 Broadway, \$79,661; (5) average bid; P. J. Moranti, Inc., 2 Wall St., \$82,035; Carfagno & Dragonetti, Inc., 1178 Clay Ave., \$88,680; Leo E. Kelly, Inc., 189 Montague St., Brooklyn, \$89,043; Riverdale Contr. Co., Inc., 37 East 28th St., \$92,025; A. L. Guidone & Co., 131 East 23d St., \$92,048; Hanover Contr. Co., 271 West 125th St., \$97,436; Melrose Constr. Co., 147 East 125th St., \$106,729; Knight & DeMico, Inc., 4441 Park Ave., Bronx, \$109,473; Gants & Reynolds, Inc., 1480 Broadway, \$129,824. Unit prices on four bidders and average bid as follows:

	(1)	(2)	(3)	(4)	(5)
11,700 cu. yds. excav. and refill.....	\$1.15	\$1.20	\$1.38	\$1.50	\$2.07
1,630 tons furnish. and lay. straight hub-and-spigot c. l. pipe	25.60	26.00	27.50	29.00	29.05
90 tons furnish. and lay. c.-i. hub-and-spigot pipe specials	66.00	75.00	59.00	70.00	70.03
130 tons haul. and lay. 48-in. c.-i. pipe.....	3.57	10.00	9.00	6.00	7.37
10 tons c.-i. valve boxes, manhole heads and covers	44.00	45.00	59.00	60.00	49.86
56,000 lbs. car. for and set. metal work furnished by city.....	.02	.025	.03	.01	.03
3,600 lbs. structural and reinforcing steel.....	.04	.05	.05	.05	.045
2,700 lbs. miscell. cast iron, wrought iron and steel.....	.05	.06	.05	.06	.055
630 bbls. Portland cement.....	1.75	1.50	1.50	1.20	1.50
470 cu. yds. concrete masry. in pavt. or curb foundations	3.85	5.00	4.00	3.50	4.99
10 cu. yds. concrete masry. as cradles for pipe sewers or drains.....	5.50	5.00	8.00	4.00	6.31
70 cu. yds. brick and concrete masry. in chambers and sewers	13.00	10.00	10.50	12.00	11.46
30 changing water services 2-in. and smaller.....	3.00	5.00	5.00	1.00	3.94
5 cu. yds. crushed stone and gravel for drains.....	2.50	2.50	2.25	1.00	2.48
200 lin. ft. vitr. or cement pipe, 3 to 8-in.....	.75	.25	.60	.20	5.77
150 lin. ft. vitr. or cement pipe, 9 to 15-in.....	1.00	1.00	1.00	.40	1.33
250 sq. yds. slag block pavt.....	1.60	1.00	2.50	1.00	2.42
1,650 sq. yds. granite block pavt.....	1.00	1.50	1.50	1.00	1.89
650 sq. yds. macadam pavt.....	.40	.25	.50	1.00	.75
150 sq. yds. cobblestone gutter.....	.01	.10	.50	.30	.42
150 lin. ft. curb.....	.01	.10	.25	.25	.22
1,400 sq. ft. cement concrete sidewalks.....	.12	.10	.20	.15	.19

Galva, Ill.—Plans have been made for water main extensions to cost \$7,000.

Joliet, Ill.—Clerk has been instructed to advertise for bids for construction of water main in Illinois St.

Palmyra, Ill.—City officials are planing to improve waterworks plant by adding filtration system and additional pumps.

Quincy, Ill.—After explanation by T. B. Pape, the city's director in Citizens' Water Works Co., Council has agreed to inspect plans submitted by water works company regarding installation of one high duty and one low duty electric pump, one low duty centrifugal steam pump, and rebuilding of north half of pumping station at Front and Maine Sts.

Fort Wayne, Ind.—17,000 ft. of new water mains—more than three miles—will be laid by city water works department during summer and fall, according to figures computed by Board of Works. Cost of extensions will be about \$22,000.

Fort Wayne, Ind.—President D. N. Foster and Secretary Charles Steiss, of Park Board, has asked Board of Works to arrange to extend city's water mains to Foster Park as beginning of schedule of improvements to be made to that area. Comfort stations, drinking foundations, etc., will be installed.

Indianapolis, Ind.—Board of Public Works has ordered Indianapolis Water Co. to lay water mains in following streets: De Quincy St., from St. Clair St. to a point 250 ft. north; Euclid Ave., from the second alley north of Michigan St. to 636 Euclid Ave.; Bosart Ave., from a point 480 ft. north of the first alley north to Michigan St. to a point 100 ft. north; Wallace St., from New York to Michigan Sts.; Applegate St., from Iowa to Beecher Sts.; Capitol Ave., from Arizona St. to a point 250 ft. south; Robson St., from Rural to Oxford Sts.; New York St., from a point east of Audubon Rd. to Bolton Ave.; South Arlington Ave., from Pennsylvania Railroad tracks to point 600 ft. south.

Rhodes, Ia.—Installation of system of water works is being considered. Estimate of cost of system is now being made.

Stanton, Ia.—Voters have decided in favor of erection of water works plant.

Seabee, Ky.—City Council has passed ordinance directing Mayor C. H. Ramsey to cause to be prepared, issued and sold bonds of city of Seabee in sum of \$13,000 for purpose of installing water works system. Bonds will be issued in denominations of \$500 each.

Cumberland, Md.—Bonds in sum of \$60,000 have been sold to Citizens' National Bank of Frostburg. Funds will be used to complete new water supply.

Laurel, Md.—Harry Stevens, Union Trust Bldg., Washington, D. C., has prepared plans for extension of water system and installation of filtration plant.

New Bedford, Mass.—At regular monthly meeting of water board various petitions for extension of main pipe were received.

Billings, Mont.—Voters will be called on June 27 to decide whether or not they wish to issue \$450,000 in bonds for purchase of plant and water system of Montana Water Co., and to pay cost of improvements made necessary by growth of city.

Billings, Mont.—The Montana Water Co. has accepted city's offer of \$315,000 for water system, and offer of 50 cents on dollar for water rentals due company by city.

Reno, Nev.—The Reno Power, Light & Water Co. has been ordered by Nevada Public Service Commission to begin construction of clarifying plant and sterilization plant for water furnished to Reno and Sparks from Truckee River before July 1, and to finish it within 90 days.

Perth Amboy, N. J.—Board of Water Commissioners is planning to enlarge pumping station at Runyon and constructing a 30-in. main from Runyon station to standpipe at Ernston. Estimated cost is \$100,000. S. J. Mason is Engr. of Bd.

Dunkirk, N. Y.—Water Board at its regular session will discuss subject of installing automatic apparatus for sterilizing the water. The board contemplates installing some system for treating water as soon as members are satisfied as to what apparatus is most suitable and efficient.

Schenectady, N. Y.—Advertising has been authorized for bids on installation of 24-in. water main.

Maumee, O.—Citizens will vote on June 26 on \$60,000 bond issue for installation of water works system.

Toledo, O.—Council has passed ordinance authorizing issuance of \$180,000 bonds to build new high-pressure pumping station.

Youngstown, O.—Purchase of equipment of pumping station is being considered.

Eugene, Ore.—Sum of \$103,820.56 for extension of Eugene's water mains and for construction of two new reservoirs is in city treasury and work upon improvements will begin at earliest date possible. Water Board is now advertising for bids for digging trenches and refilling them, and connecting and laying water mains, to be received up to 10 a. m., June 5. Bids call for laying of approximately 2,200 ft. of 12-in. mains, 6,800 ft. of 10-in. mains, 12,200 ft. of 8-in. mains and 400 ft. of 6-in. mains. All materials and tools are to be furnished by city.

Salem, Ore.—Application has been made to State Engineer Lewis by officials of Warrenton for permission to appropriate waters of Lewis and Clark River for municipal purposes. Officials represent in their application that they intend to build pipe line 20 miles long, and that cost of works will be \$350,000. In addition to supplying Warrenton they also propose to supply water to New Astoria, Seaside, Gearhart and Fort Stevens.

Allendale, S. C.—Bids will be received by W. F. Googe, Chr. Bd. of Public Wks., until 12 o'clock noon, June 10, 1914, for \$65,000 5 per cent. 40-year water, lights and sewer bonds.

Fort Mill, S. C.—Commissioners of Public Works have opened bids submitted by nine competing contractors for construction of water works system. Bids for construction of pipe lines only were received and ranged from \$10,239.50 down to \$8,415, latter bid being that of Frank Moore of Cordele, Ga. This bid with that of Porter & Boyd, of Charlotte, N. C., of \$8,718, is being considered by board and the award will probably be made to one of them. Bids for construction of a 100,000 gallon tank on a 75-ft. tower will be opened and contract awarded. H. L. Jaudon, of Savannah, Ga., has been employed as consulting and supervising engineer.

Nashville, Tenn.—Commissioner Elliott has introduced bill for appropriating \$2,000 for purchase and installation of electrical pump for water works department.

Nashville, Tenn.—Bill has been passed appropriating \$2,000 for purchasing and installing electric water pump.

CONTRACTS AWARDED.

Jacksonville, Fla.—At meeting of water committee of board of bond trustees, bid of the Chapman Valve Manufacturing Co., Indian Orchard, Mass., was accepted and approved and utensils for water department ordered. Among other technical specifications, order includes some 19 36x60-in. sluice gates; 4 42x48-in. gates, shear valves, operating stands and gate valves, including the 30-in. variety.

Mt. Pleasant, Ia.—To K. A. Bergdahl, for construction of cement water reservoir with capacity of 200,000 gals., at \$4,150.

Perry, Ia.—By City Council to Ward & Weighton, Sioux City, for construction of 500,000-gal. reservoir of concrete and steel, at \$8,585.

Goodland, Kan.—For installation of water system to Gordon & Taylor Construction Co., Century Bldg., Denver, Colo., at \$24,210. C. C. Calvert is City Engr.

Louisville, Ky.—Work on building of new water works at Anchorage, contract for which was awarded to L. W. Hancock & Co., of Louisville, by Board of Trustees of the town, will commence Sept. 1.

Grand Rapids, Mich.—Verhey & Klute were given contract for laying water mains in Blissell St. from Norwood to Benjamin Aves., for \$762.80.

Grandville, Mich.—To Hydraulic Engr. Co., 106 Michigan Trust Bldg., Grand Rapids, Mich., contract for waterworks system for Grandville to cost \$12,000. Wernett, Bradfield & Mead are engr., Grand Rapids.

Duluth, Minn.—Contract for laying of water and gas mains from the New Duluth to Gary has been officially let by City Commission. The Pastoret Construction Co. will do work at contract price of \$6,626.66.

St. Louis, Mo.—By Bd. Pub. Improv., for water supplies as follows: To U. S. Cast Iron Pipe Co., Chicago, Ill., 30 tons 3-in. c. i. coated water pipe, \$27.60 per ton, and 970 tons 6, 20, 30 and 36-in., \$22.60 per ton; total, \$22,750. To Bessemer Fdry. & Machine Co., Bessemer, Ala., 270 tons c. i. coated special castings, \$41.84 per ton; total, \$11,296. To A. P. Smith Mfg. Co., East Orange, N. J., 3-in. to 20-in. stop valves; total, \$3,580. To Kennedy Valve Co., Elmira, N. Y., hydrants and top parts, total \$12,027.

Bayonne, N. J.—For laying water mains to Charles T. Kavanagh, Bayonne, at \$7,346.

South Orange, N. J.—Contract for laying of mains in Grove Ter. has been awarded to lowest bidder, Lepre & Magliaro, of South Orange.

Sea Breeze, N. Y.—For construction of water system to W. G. Fritz Co., Newark, N. J., at \$20,811, by Water Commissioners. H. C. Kittredge is Engr.

Schenectady, N. Y.—To John Allen, contract for laying of 24-in. water main in Union St.

Schenectady, N. Y.—By Board of Contract and Supply to John Allen contract for constructing 24-inch water main at \$12,185.60. Other bids submitted were: Kellam and Shaffer, \$22,020.54; W. D. Goodale, \$16,278.27; T. R. Crane, \$14,166.50.

Harrisburg, Pa.—The Pennsylvania Salt Mfg. Co. was awarded contract to furnish 200,000 lbs. of alum to city. They propose to furnish product for \$1.02½ a hundred pounds. The Arnold Hoffman Co. received contract for hypochlorite of lime, bidding \$1.70 a hundred pounds. Products will be used at filter plant. The Coppus Engineering Co., of Scranton, will equip pumping station with four new boilers. They will cost city \$2,531.

Fort Mill, S. C.—Commissioners of Public Works have finally let contract for construction of pipe lines in water works system at price of \$8,415. Contract for 100,000-gal. tank was let to Southern Engineering Co., of Charlotte, at price of \$3,139.

Lancaster, S. C.—For waterworks extension; contract was awarded to Dyssard Construction Co., of Atlanta, at \$7,989.

Norfolk, Va.—The Norfolk Structural Steel Co., located in Berkley, has been given contract by Board of Control for furnishing 5,000 iron water meter boxes at \$1.20 each. Board also let to Hays Mfg. Co., of Erie, Pa., contract for 1,000 curb boxes and 500 extra covers, for Water Department, at \$605. In few days contracts will be awarded for meters to go into these boxes, and when these have been installed 90 per cent of water system of city will have been metered.

North Yakima, Wash.—To Cascade Constr. Co., for installation of Capital Hill water pipe line, at \$12,264.

Seattle, Wash.—City Engineer Dimock has returned proposals on following improvement, with recommendation that contract be awarded to low bidder: 26th Ave., S. W., water mains, L. R. Ellis, \$12,410.50.

Colfax, Wis.—For constructing water works to J. M. Donahue, Stevens Point, at \$13,066. W. D. Lovell, Minneapolis, Minn., bid was \$13,765. B. A. Anderson is Village Clk.

Estevan, Sask.—For laying water and sewer mains by city to United States Cast Iron Pipe & Foundry Co., South Michigan Ave., Chicago, Ill., at \$8,870.

LIGHTING AND POWER

Safford, Ariz.—New electric light plant will be erected at once.

Riverside, Cal.—City Trustees are considering installation of ornamental lighting system, consisting of one-lamp standards on Lime St., from 1st to 8th Sts. A. P. Campbell is City Engr.

Hartford, Conn.—Contract Board has opened bids for ornamental lighting fixtures for new municipal building. Bids varied from \$21,660, figure of the Tiffany Studios, New York, to \$57,160, the bid of Green Electric Co., of this city. Bids were referred to municipal building commission for consideration. Commission will submit its report to contract board, so that contract may be awarded in a few days. Following was list of bidders: Pettingell-Andrews Co., Boston, \$25,417.75; Wahle, Phillips Co., New York, \$26,958; Tiffany Studios, New York, \$21,660; Mitchell-Vance Co., New York, \$27,760.37; Cassidy & Son's Manufacturing Co., \$36,486; Green Electric Co., Hartford, \$57,160; Baldwin-Stewart Co., Hartford, \$26,253.50; Edward Schroeder Lamp Co., New York, \$29,500; Edward F. Caldwell & Co., New York, \$25,970; Hanlon & Murphy, Hartford, \$39,000.

Palmyra, Ill.—City officials contemplate changes in electric light plant.

Sterling, Ill.—Bids for new curb lights have been opened by Board of Local Improvements. Twenty-two bids were received, covering various divisions of specifications.

Anderson, Ind.—Eighteen bids for placing new cluster electric light system in business district have been opened by Board of Public Works. The Hatfield Electric Co. and Sanborn Electric Co., of Indianapolis, were among bidders. Board announced two or three days would be required for reviewing proposals. Estimate on cost ranges from \$21,000 to \$31,000.

Richmond, Ind.—Arrangements for extending electric lighting service into Morton Park have been made, when Bd. of Public Works ordered Superintendent Kleinknecht of municipal plant to run line into park along south bank, distance of 1,000 feet, to which will be attached five arc lamps.

Manhattan, Kan.—City is considering purchase of electric light plant.

Holyoke, Mass.—Following is estimate made by Manager J. J. Kirkpatrick, of Gas and Electric Department, for installing lights in South Holyoke: 69,000 duct ft., \$19,320; 16,800 ft. sheraud, \$13,776; 7,500 ft. arc cable, \$1,875; 60 standards with base, \$4,200; 60 lamps with rectifiers, \$3,600; manholes, \$6,500; connections with buildings, \$1,000; total, \$50,271. This estimate does not include cable for commercial lighting and power purposes, which would be about \$43,000, but includes all work required to put such cables underground.

Pittsfield, Mass.—Provided recommendations of City Committee on Fuel and Street Lights are carried out, this city will have most up-to-date apparatus for its street lighting system and price per lamp will be somewhat less than present cost of flaming arc lamps in and about the center of city. Committee voted to ask Pittsfield Electric Co. to submit to City Solicitor contract drawn up for term of five years, embracing use of luminous direct-current arc lamp made by General Electric Co. and similar to lamp on Eagle St. This will necessitate changing over apparatus and wiring at power station, but company is willing to do this. Company will also install wires under ground, buy lamps, posts, etc., at cost of about \$12,000, and own them, city simply renting them and buying the power.

Springfield, Mass.—Plans are being discussed by city officials for new lighting system for Court Square. Present cluster lamps will be replaced with new magnetic arc lamps. Order for 50 additional arc lamps for business section will be submitted to City Council.

Battle Creek, Mich.—Steps are being made to extend ornamental lighting system on West Main St. to Washington St. and on Washington St. to Sanitarium Annex.

Ishpeming, Mich.—City Council has approved of expenditure of \$5,955 for installation of ornamental lamps and asphalt construction.

Carlton, Minn.—Plans have been approved by Village Council for improvement of street lighting system, including installation of new lamps.

Great Falls, Mont.—Council has ordered First Ave. north lighted with ornamental lighting posts to cost \$126.50 per post, installed.

Rahway, N. J.—City Clerk Lambert has been instructed to advertise for bids for lighting of city streets, bids to be opened at next regular meeting.

Binghamton, N. Y.—Proposition to issue \$148,200 worth of bonds for erection of municipal lighting plant has been carried. Ordinance authorizing sale of bonds will be introduced at Common Council.

Ogdensburg, N. Y.—Business section of Ford St. is soon to be equipped with cluster lights, as result of acceptance by Common Council of contract between Ogdensburg Power & Light Co. and city. Power company agreed to furnish city with 136 arc lights and 37 tungsten lights; city agrees to pay \$10,500 annually for five years, beginning December 1.

Canton, Ohio.—Mayor Stolberg is considering plans for replacing present arc lamps with incandescent cluster lamps mounted on iron standards.

Marion, O.—Ordinance has been adopted for improvement of lighting system.

Norwood, O.—Bids may soon be asked for electric works in new city hall.

Eugene, Ore.—Richard H. Clow, of Mapleton, has been granted franchise by county court for construction and maintenance of system of electric light and power wires on streets of that unincorporated town and on some county roads adjacent.

Providence, R. I.—Plans are being discussed for installation of about 7,000 of new nitrogen incandescent street lamps in outlying sections of city, in place of present carbon incandescent lamps.

Allendale, S. C.—See "Water Supply."

Spartanburg, S. C.—Installation of "Great White Way" is being considered.

Chattanooga, Tenn.—Specifications for 5-year contract for lighting city streets and parks, submitted by Commissioner Warner, of Department of Public Utilities, Grounds and Buildings, have been approved by Board of Commissioners. It was decided to advertise immediately for bids on contract, bids to be opened on July 10.

Dutton, Ont.—Town Council is considering installation of hydroelectric system.

CONTRACTS AWARDED.

Hartford, Conn.—Board has heard read communication from municipal building commission recommending award of contract for electric lighting fixtures in municipal building to Tiffany Art Studios of New York, lowest bidder at \$21,660. Board has voted to award contract, municipal building commission to arrange details and arrange for surety bond of 50 per cent.

Wilmington, Del.—Contract for gas lighting for next five years has been awarded to Wilmington Coal Gas Co., on basis of \$23.50 a light.

Richmond, Ind.—Bidding against 13 contractors, Richmond Electric Co. was awarded contract to furnish street lighting system for Anderson. Cost of installation will be \$25,000. Specifications call for 315 clusters of five lights each throughout business section of city.

Hillside, N. J.—The Public Service Electric Company was awarded contract for installing 108 25-candlepower electric lights in township by Township Committee. Contract is for period of five years and number of lamps may be increased from time to time. Graduated scale of prices is named in contract as follows: For the first 50 lamps \$18 per lamp per year; from 51 to 100 lamps, \$16.65 each per year; all over 100, \$15.30.

Newark, N. J.—Board of Works has decided to enter into 5-year contract with Public Service Electric Co., Newark, N. J., for lighting the city, in part, with nitrogen lamps. Proposition made by company, when it offered to install 200 lamps at once and 500 a year, was accepted.

Urbana, O.—By unanimous vote of City Council it was voted to grant new franchise to Urbana Light Co. for period of 10 years. Recommendation in substance as adopted by Council is that Urbana Light Co. will furnish, maintain and operate for lighting of the streets, etc., not less than 100 four-ampere metallic flame arc lights and such lights and such incandescent light as city may require, and also such ornamental arc standards and incandescents as city may require. Ornamental standards are to support two 50-candle power and one 80-candle power or four 50 and one 80-candle power lights. The metallic flame arc lights are to cost \$57.50 a year per light; the incandescents, \$25 a year; the 3-light ornamental, \$40 a year; the 5-light ornamental, \$56.

Carbondale, Pa.—By Council, to Scranton El. Co., of Scranton, contracts for lighting streets and public buildings for period of five years. Present arc lamp lighting system will be replaced with incandescent street lamps.

Philadelphia, Pa.—There was no competition for gasoline lighting contract for 1915 when bids were opened in Bureau of Lighting. Welsbach Street Lighting Co. submitted bid of \$29 a lamp per year, the same price paid by city for past two years. There have been 19,071 gasoline lamps in use, but specifications provide for reduction in number.

FIRE EQUIPMENT

Richmond, Cal.—Purchase of aerial truck and motor hose wagon is being urged.

Sacramento, Cal.—Specifications for about \$25,000 worth of fire-fighting apparatus which City Commissioner Charles A. Bliss desires to purchase, prepared by Fire Chief Anderson, will shortly be presented to City Commission for approval. Additional apparatus it is desired to buy is of motor-driven type, and, if purchased, will go far toward placing Sacramento Fire Department on metropolitan basis. Individual pieces called for are as follows: One motor tractor for the present horse-drawn aerial truck; one motor-driven gasoline fire engine similar to the present new engine in use; one gasoline, 80-gal. chemical engine; one chassis for a present horse-drawn chemical engine.

Putnam, Conn.—Citizens have voted in favor of appropriating \$6,000 for purchase of motor combination chemical and hose wagon and other equipment.

Augusta, Ga.—Fire committee of City Council, of which Mr. T. S. Raworth is chairman, will probably hold meeting shortly to decide upon selection of various apparatus that will be needed to thoroughly equip new engine house in Sixth Ward, which will soon be completed.

Dubuque, Ia.—Purchase of automobile fire engine will shortly be taken up.

Beverly, Mass.—Eight different makers of fire hose have submitted bids to Public Service Committee. On double jacket, knit, Combination Ladder Co. bid 60 cts.; the C. Callahan Co., 75 cts.; Boston Wove Hose Co., 75 cts.; A. K. Barnes Co., 62 cts., and N. J. Car Spring & Rubber Co., 75 cts., with 2 per cent off. For double jacket woven, Combination Ladder Co. bid 65 cts.; Boston Woven Hose Co., 75 cts.; A. K. Barnes Co., 62 cts.; Boston Belting Co., 67 cts., and 72 cts. for different brands; the C. C. Co., 65 cts.; Globe Rubber Wks., 74 cts., and N. J. Car Spring & Rubber Co., 70 and 72 cts., with 2 per cent off on different grades. For single knit jacket the C. Callahan Co. bid 65 cts.

New Bedford, Mass.—Committee has voted to advertise for bids for 2,000 ft. of hose, and also for two automobile chassis on specifications to be drawn by chief of department.

Lansing, Mich.—Chief Hugo R. Delfs has recommended purchase of motor aerial truck.

Bayonne, N. J.—Council has passed resolution to purchase site at Boulevard and 16th St., where engine house will be erected. Price agreed upon is \$7,500.

Edgewater, N. J.—Council has approved of resolution authorizing purchase of 1,500 ft. of hose.

Elizabeth, N. J.—Resolution has been adopted to provide for issue of bonds to amount of \$23,700 for purpose of purchasing fire engines, apparatus and appliances for the Fire Department.

Millville, N. J.—See "Sewerage."

Newark, N. J.—Plans have been accepted for new fire house at Essex Co. Hospital, at Overbrook.

Plainfield, N. J.—Resolution has been adopted by Common Council authorizing City Clerk to advertise for proposals to furnish 4-cylinder, triple combination motor pumping fire engine, and hose carrier with pumping capacity of not less than 700 gals. per minute against 120 lbs. net water pressure, and equipped with two chemical tanks. July 6 was date set for receiving and opening the bids.

South Orange, N. J.—Bids will be received by Committee on Finance of Board of Trustees until 8 p. m. June 15, for \$10,000 10-year serial fire equipment bonds. Frank Fenner is Treasurer of village.

Dunkirk, N. Y.—Board of Police and Fire Commissioners is contemplating purchase of combination chemical and hose automobile with water pump attachment for use at East Fourth St. fire hall.

New York City, N. Y.—Bids will be received for seven motor-driven combination chemical and hose carts by Fire Commissioner Robert Adamson.

Niagara Falls, N. Y.—It has been decided to purchase motor tractor for aerial hook and ladder now at headquarters. Estimated cost \$4,000. Bids will be received on June 16.

Schenectady, N. Y.—Five bids have been received for combination wagon for hose station No. 9, as follows: Jas. Boyd & Bros., Philadelphia, \$5,400; Close Bros., Schenectady, \$5,112.80; Seagrave Co., Columbus, O., \$5,485; Hamilton Motor Truck Co., Albany, \$5,349; Martin Carriage Co., York, Pa., \$5,400; American La France Fire Engine Co., New York, \$4,465.

Schenectady, N. Y.—Bids will be opened shortly for wire cable for police and fire alarm conduits.

Schenectady, N. Y.—Resolutions calling for bids for new combination motor hose and chemical outfit have been adopted.

Salem, O.—Motorization of fire department is being considered.

Cambria City, Pa.—City is planning to complete placing of telegraph system wires underground, to mount fire alarm boxes on pedestals designed to accommodate both fire and police call boxes. Purchasing Agent Nathan Miller has been instructed to get bids from various companies on pedestals, as well as 1,000 feet of conduit.

Hazleton, Pa.—Bids have been received for triple combination fire engine, but Council decided that it would require sometime to look into specifications before purchase could be made intelligently. Bids were received from Aaron Fox Fire Engine Co., \$10,000 less 7½ per cent. Seagraves & Co., of Boston, sent specifications and proposals, but failed to enclose certified check as demanded. The Hazleton Machinery & Supply Co. submitted proposals on two makes of Robinson machines, one to cost \$7,200 and other \$8,500, company agreeing to send competent engineer to erect machine and instruct man of Council's selection in its operation. James W. Boyd & Co., Inc., submitted two bids: A four-cylinder for \$8,500, less 10 per cent; 6-cylinder \$9,000, less 10 per cent for cash. American-LaFrance Co., Elmira, N. Y., 100 h. p. pumping 880 gals. per minute, \$9,000, less \$500 cash ten days; 70 h. p. 500 gals., \$8,000, less \$500, ten days; 200 h. p., 1,400 gals., \$10,000, less \$500 ten days.

Pottstown, Pa.—The West End Fire Company, in suburbs of Pottstown, will purchase triple combination auto truck and engine at cost of \$6,000.

Tamaqua, Pa.—The American Hose Co., of Tamaqua, has decided to purchase auto fire engine.

Providence, R. I.—Purchase of new fire alarm equipment is urged.

Tiverton, R. I.—Town Council has voted to buy for \$3,600 a Maxim fire truck, equipped with 40-horsepower engine, two 40-gal. chemical tanks, four smaller tanks, extinguishers and ladders.

Greenwood, S. C.—H. Gerard Hartzog, Councilman, would like to hear from manufacturers of fire fighting apparatus, engines, hose, etc.

Newport News, Va.—City Council Finance Committee has recommended that city borrow \$15,000 with which to motorize entire Fire Department.

Rutland, Vt.—Motorizing of fire department is being discussed. Estimated cost \$28,000.

Hoquiam, Wash.—City Commission will receive bids at once for furnishing 1,000 ft. of hose.

Seattle, Wash.—Chief Stetson, of Fire Department, has submitted request that a one-ton motor truck be purchased for his department's use. Appropriation of \$3,600 is available for the purpose.

Crivitz, Wis.—Council has approved of purchase of 1,000 ft. of hose and engine.

Neenah, Wis.—City officials are contemplating purchase of combination auto hose truck and chemical engine to supplant all fire-fighting equipment. It is probable that street flushing wagon will be purchased for cleaning of streets.

CONTRACTS AWARDED.

Phoenix, Ariz.—Contract for 1,000 ft. of new fire hose has been awarded to Arizona Hardware Supply Co.

Jacksonville, Fla.—At meeting of Fire Committee of Board of Bond Trustees, committee accepted proposal of American-La France Fire Engine Co., Inc., of \$9,000 for purchase of new automobile fire engine. Contract calls for one triple expansion auto (hose, chemical and pump) fire engine guaranteed to deliver 700 gals. of water per min.

Newton, Ill.—To Obenchain & Boyer, of Logansport, Ind., for 90-gal. chemical engine, at \$600.

Waterloo, Ia.—For motor service truck to American-La France Fire Engine Co., of Elmira, N. Y., at \$6,200. New truck will be 6 cylinder machine of 100 h. p.

Holyoke, Mass.—Board of Fire Commissioners has voted to recommend acceptance of bid of Gamewell Co. for installation of proposed new telegraph fire alarm system.

South Orange, N. J.—Contracts for motor apparatus for fire department to replace present horse-drawn vehicles have been awarded. Trustee Harry J. Schnell stated that thirteen bids had been received for combination chemical and hose truck, bids ranging from \$3,500 to \$6,400. Greene Motor Car Co., of this city, whose bid was \$3,700, won contract. Nine bids were received for hook and ladder truck and contract was awarded to lowest bidder, the Seagrave Co., of Columbus, O. Their bid was \$6,200.

Carbondale, Pa.—To C. C. C. Fire Hose Co., of Boston, Mass., contract for 1,500 ft. of hose, at 90c. per foot.

Hanover, Pa.—By Hanover Township Commissioners contract for erection of six districts to Contractor Herman Mailander, of Lee Park, whose bid is \$62,000. Bids were received also from E. T. Long, of this city, \$67,000; E. J. Donahue, of Newtown, \$66,900; Stipp Construction Co., of Scranton, \$65,000, and Kehoe and Mowery, of this city, \$64,000.

Follansbee, W. Va.—Contract for 500 ft. of fire hose has been awarded to Eureka Fire Hose Mfg. Co., at \$1.10 per ft.

Superior, Wis.—To American-La France Fire Engine Co., Inc., of Elmira, N. Y., for triple combination pump, chemical and hose motor car.

BRIDGES

Montgomery, Ala.—Board of Revenue of Montgomery County has ordered construction of bridge over Eight-Mile Creek at intersection of Ware's Ferry Road. Board is also considering erection of bridge over Pintla Creek.

Willows, Cal.—The Ross Construction Co. of Sacramento is now receiving material at Butte City for construction of two approaches to bridge across the Sacramento River at that town. Approaches will cost the county \$35,000.

Freeport, Ill.—Bond issue of \$8,000 will be submitted to voters of Loran Township at an election which will soon be called by Town Board, this being agreed to by adopting resolution at Pearl City and will be used for new bridges and repairs of old structures.

Quincy, Ill.—County Superintendent of Highways Floyd Bell has completed drawing of plans for new bridge that is proposed for Northeast township, within 2 miles of La Prairie, over southwest ford in Cedar Creek. It is estimated that improvement will cost about \$1,760.

Columbia City, Ind.—The National Concrete Co., Indianapolis, has filed plans with Whitley Co. Comrs. for proposed reinforced concrete bridge at Main St.

Belleville, Kan.—New cement wagon bridge is to be built over Republican River this summer. It will be of concrete and steel construction, with cement floor and concrete abutments and piers.

Lawrence, Mass.—The erection of Central bridge is now assured. By unanimous vote, Municipal Council has voted to advertise order to borrow one million dollars outside debt limit for erection of bridge.

Billings, Mont.—The Security Bridge Co., lowest bidder, has been awarded contract for construction of 10 steel and concrete bridges on various roads throughout county. Bid of successful contractor was \$15,731.20, which was \$474.80 lower than next lowest bid. Other bids were: Northwestern Bridge Co., \$19,000; Twin City Bridge Co., \$17,888; Mid-West Bridge Co., \$19,500; Midland Bridge Co., \$17,777; Montana Bridge & Structural Co., \$16,575; O. E. Peppard, \$16,206.

Boulder, Mont.—Plans will be prepared and bids advertised for erection of bridge over Jefferson River, near Willow Creek.

Cranford, N. J.—Appropriation of \$13,000 has been made by Board of Chosen Freeholders of Union County for construction of new bridge on Springfield Ave. to replace present Beadles Bridge. Jacob G. Bauer, Elizabeth, N. J., is County Eng'r.

Cleveland, O.—Ordinance has been introduced calling special election Aug. 11

on proposition to issue \$950,000 of bonds for completing Clark Ave. high-level bridge.

Sterling, Ill.—New plate girder bridge across Rock river here, to take place of old enclosed structure, is to be erected this summer. Estimated cost, \$150,000.

Indianapolis, Ind.—Bids have been opened by Board of Public Works for construction of superstructure of bridge to be erected across Pleasant run at Minnesota St. Bids, which were taken under advisement, were: McClintick-Marshall Co., Pittsburg, \$7,757; Central States Bridge Co., Indianapolis, \$7,355, and the Bellefontaine Bridge and Steel Co., Bellefontaine, O., \$7,850.

Plaquemine, La.—Police jury has passed resolution appropriating \$6,000 for construction of bridge across Bayou Grosse Tete at Indian Village Point.

Columbus, O.—Council Finance Committee has approved ordinance appropriating \$35,000 for construction of concrete viaduct at Indiana Ave. and Glen Echo Drive.

Philadelphia, Pa.—Chief Webster, of Survey Bureau, has opened 10 bids submitted for construction of steel and concrete inter-county bridge to be erected over Darby Creek, on line of 84th St. Low bidder was Carl R. Cramp, at \$32,371. The other bids were: Enos L. Seeds, \$34,800; C. P. Grim, \$35,200; James Kelley, \$35,670; A. L. Carhart, \$37,000; F. J. Boas, \$38,219; M. & J. McHugh, \$38,600; John McMenamy, \$39,395; Richard Walsh, \$42,500, and T. P. Smart, \$48,492.

Warwick, R. I.—Councilman Frank W. Whittle, of Pontiac, will recommend construction of concrete arch bridge 185 ft. long, with roadway 25 ft. wide and sidewalk 5 ft. wide, to be built across Pawtuxet River at Natick. Approximate cost of structure is \$14,000, to be borne equally by this town and town of West Warwick.

Woonsocket, R. I.—Board has passed and communicated to Common Council resolution appropriating \$4,000 to build footbridge over Blackstone river from Sayles St. to Fairmount St.

Bastrop, Tex.—Election will be called by Commissioners' Court on proposition to issue \$50,000 of bonds for bridge over Colorado River at Nash's Ferry, 9 miles above Bastrop.

CONTRACTS AWARDED.

Redding, Cal.—By Board of Supervisors of Shasta County for construction of concrete bridge across Sacramento River at Reids Ferry on State Highway to Chico Construction Co., at \$49,650. Other bidders as follows: The Ross Construction Co., \$57,777; W. N. Concannon Co., \$52,785; F. Rolandi, \$53,450.

Muncie, Ind.—County Board has awarded contracts for improvements on four bridges and awarded contracts for construction of two new roads. The Indiana Bridge Co. secured work of extending the Elm and Washington St. bridges, price being \$5,885 and \$5,115, respectively. Harry V. Moore was given work of reflooring and building sidewalk at Broadway bridge, contract price being \$2,898. The Indiana Bridge Co. also secured work of improvement at John W. Long bridge for \$655.

Estherville, Ia.—By Board of Supervisors of Emmet County for construction of bridge over Des Moines River at Estherville to N. M. Stark & Co., Des Moines, at \$12,051. Other bidders as follows: The Marsh Engineering Co., \$13,856; Miller-Hey Construction Co., \$14,000; Reed & Reed, \$14,790; Thor Construction Co., \$14,308.

Annapolis, Md.—The McLean Contracting Co., of Baltimore, has submitted lowest bid for construction of College Creek bridge and will be given contract by State Roads Commission. Bid was \$35,600. Bridge is part of Annapolis-Baltimore boulevard and is to be of concrete with 40-ft. lift draw.

Mountain Iron, Minn.—Bids have been opened for building of concrete bridge in village limits and contract awarded to Gus Linden for \$2,050.

Butte, Mont.—Contract for construction of Big Hole river bridge at intersection of Silver Bow and Beaverhead counties has been awarded to O. E. Peppard of Missoula. New structure will be of steel.

Dillon, Mont.—At joint meeting of commissioners of Beaverhead and Silver Bow Counties contract for construction of steel bridge over Big Hole River, at Divide, near dam site, was awarded to O. E. Peppard Construction Co., of Missoula, for \$8,998, this being lowest bid of 21 submitted to commissioners.

New Brunswick, N. J.—Schneider & Stelle's low bid of \$918.17 won for that firm contract for repairs to steel and concrete bridge over Union Ave., Bound Brook. Other bidders were: John F. McGovern, New Brunswick, N. J., \$1,537.47; W. F. Winegar, Bound Brook, \$2,112.50; Abraham Jelin, New Brunswick, N. J., \$1,433.85.

New Brunswick, N. J.—Alderman John F. McGovern has been awarded contract for construction of bridge over Devil's brook, on Aqueduct, Plainsboro-Branbury Rd., by Board of Freeholders. Mr. McGovern's bid was \$1,300.

Mount Vernon, O.—To Hackedorn Construction Co. at \$4,337 for E. 9th St. bridge.

Lehigh Gap, Pa.—By Carbon County Commissioners contract for county bridge across Aquashicola Creek, at Lehigh Gap, to Whitaker & Diehl, Harrisburg, on bid of \$6,244.

Philadelphia, Pa.—Contract for construction of inter-county bridge over Darby Creek on line of 84th St. has been awarded to Carl L. Camp, low bidder, for \$32,996.50.

Houston, Tex.—Contract for construction of North Main St. bridge across Little White Oak Bayou has been awarded to W. L. Pearson & Son at \$30,000.

MISCELLANEOUS

Oakland, Cal.—An ordinance formally calling special election on June 12 to vote upon issuance of \$500,000 worth of bonds for completion of municipal auditorium, was given its first and second readings and passed by City Council.

Wilmington, Del.—Remick, Hodges & Co., of New York, were awarded entire issue of \$200,000 building fund bonds.

Augusta, Ga.—Election has been carried authorizing \$750,000 bond issue for completion of levee and city hospital.

Bloomington, Ill.—Question of purchasing automobile patrol is being discussed.

Council Bluffs, Ia.—Purchase of combination patrol and ambulance for police department has been authorized. Bids will be opened about June 22.

Dubuque, Ia.—Purchase of automobile ambulance, to cost about \$3,000, has been authorized.

Haverhill, Mass.—Raising of fund to be devoted to purchase of police automobile ambulance is being advocated.

Taunton, Mass.—Purchase of motor-driven patrol wagon will be considered.

Duluth, Minn.—A bubbling fountain has been ordered installed at Garfield Ave. and Superior St., cost to be paid from general fund.

Garwood, N. J.—The Garwood Borough Council has decided to call special election about middle of June for purpose of obtaining vote on proposition to issue \$9,000 in bonds for erection of Borough Hall on municipal lot at Centre St. and South Ave.

Millville, N. J.—See "Sewerage."

South Orange, N. J.—Bids will be received by Committee on Finance of board of trustees until 8 p. m. June 15 for \$28,000, 30 year Playground bonds. Frank Fenner is Treasurer of village.

Buffalo, N. Y.—See "Water Supply."

Schenectady, N. Y.—Bids will be opened shortly for wire cable for police and fire alarm conduits.

Akron, O.—Bids will be received at office of City Auditor of City of Akron, Ohio, until 12 o'clock of 30th day of June, 1914, for purchase of \$446,000, 4½ per cent., City of Akron, Little Cuyahoga River Purification Coupon Bonds. James McCausland is City Auditor.

Newark, O.—City Solicitor Ralph Norpell is engaged in preparing \$240,000 bonds that are to be issued for subway improvement.

Erie, Pa.—Resolution has been introduced by Mayor Stern to effect that Council accept proposition of Jacob Roth for purchase of Cadillac auto patrol for sum of \$2,905. Body of new patrol will be 6 ft. and 6 in. in length and will hold twelve people.

Central Falls, R. I.—Resolutions appropriating \$12,525 have been passed at meeting of Common Council and referred to Board of Aldermen for concurrence. Included in batch was one resolution calling for appropriation of \$8,000 for completion and equipment of new police station.

Spartanburg, S. C.—Plans have been made for erection of city hall and jail to cost about \$25,000.

Nashville, Tenn.—That provision be made in annual budget for next year for purchase of at least two combination automobile sprinkling and flushing wagons of large capacity for sprinkling department will be recommended to Board of City Commissioners by J. D. Alexander, Commissioner of department.

Beaumont, Tex.—Proposition of issuing bonds in sum of \$175,000 for building of wharf sheds at this place has been carried by a 3 to 1 majority.

San Antonio, Tex.—Council has called for bids on 10,000 to 25,000 cu. yds. of sand.

CONTRACTS AWARDED.

Bridgeport, Conn.—At meeting of Board of Park Commissioners bids for construction of sea wall at Seaside park west of bath houses were opened. Lowest bid was that of William H. Eagan of New York, who quoted price of \$18,879.21. Other four bidders and their quotations were: The Rennell Construction Co. of New York, \$18,934.50; Toole & Sunderlin of this city, \$21,329.50; Toomey Brothers of New York, \$12,006.50, exclusive of filling, and R. M. Brown of New York, \$24,494.

Kendallville, Ind.—By City Council contract for construction of new city hall to J. W. Goodall & Sons, Peru, Ind. Contract price is \$27,850.

LIGHTING AND POWER

Lafayette, Ind.—Ornamental lamp posts for levee are favored by Chamber of Commerce, directors going on record as favoring cast iron standards and requesting Board of County Commissioners to prepare specifications.

Lima, O.—The light committee will recommend submission in November of issue of \$76,000 to establish boulevard system of lighting in business district and for generating plant, to be located at East Lima water station, to supply current for boulevard lights and for lighting city parks, bridges and other municipal property.

CONTRACTS AWARDED.

Sterling, Ill.—Contract for installation of new curb lighting system has been let to Electrical Construction and Machinery Co. of Rock Island. This company's bid was \$7,997 on revised specifications. Contract was let on basis as follows: Charter posts with Holophane top, new type "C" nitrogen filled Tungsten lamp, 320 watts, 600 candle power, made by the Shelby branch of the General Electric Co., Simplex cable; Electric Appliance Co.'s "A-W" regulator with switchboard, etc., and compensator.

Cambridge City, Ind.—Contract for cluster lights to be placed on Main St., between Green and Jones Sts., has been let to Central Electric Co. of Chicago. Price to be paid is \$1,700. There will be five lamps to each cluster.

FIRE EQUIPMENT

Groveland, Mass.—Town will vote on question of purchasing motor combination wagon for fire department.

St. Joseph, Mo.—Purchase of fire truck is being considered.

Lima, O.—Two bond issues, totaling \$126,000 will be recommended to city council for submission to voters in November. Safety committee will recommend submission of issue of \$50,000 for two new hose houses, one of South and one in East Lima, for necessary equipment for these houses, and for motorizing of fire apparatus at Central fire department.

Pottstown, Pa.—The Philadelphia Fire Co., of Pottstown, has decided to purchase "three-in-one" auto apparatus for \$9,000.

Pottsville, Pa.—Resolution that superintendent of accounts and finance be authorized to ask bids for hose needed for fire department, according to appropriation, has been adopted without dissent.

CONTRACT AWARDED.

Chisholm, Minn.—Contract for fire alarm boxes has been awarded to Barney Graham.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS				
Ohio, Mt. Vernon	Noon, June 13	Grading, draining, curbing and paving	W. H. White, Dir. Pub. Serv.
N. J., Perth Amboy	8.30 p.m., June 15	Constructing asphalt block pavement	D. M. Adair, Street Comr.	
N. J., Bloomfield	.....8 p.m., June 15	2,500 ft. concrete sidewalk, 10 cu. yds. grading	R. F. Davis, Town Clerk
Minn., Duluth	.....10 a.m., June 15	755 sq. yds. of 4-in. creosote blocks and 54,360 ft. of 4-in. tamarack plank	C. S. Palmer, Clerk
Pa., Beaver	.....7 p.m., June 15	Grading, pav. with vit. repressed brick, conc. curb, etc.	L. S. Patten, Sec.
Ind., Batesville	.....7.30 p.m., June 15	Cement sidewalk, curb and gutters	J. F. Dreacher, City Clerk
Ill., Galva	.....4 p.m., June 15	Brick pavement and appurtenances	Board of Loc. Imps.
Conn., So. Manchester	5 p.m., June 16	Constructing 12,000 ft. of granite curbing	Selectmen	
Ohio, Cadiz	.....2 p.m., June 16	Grading & paving with brick, also bridges & culverts	A. R. Marker, State Hwy. Comr., Columbus
W. Va., Huntersville	.....Noon, June 23	258 rods of road	County Commissioners
Pa., Scranton	.....11 a.m., June 24	Constructing macadam road	C. P. Savage, Co. Controller
Ohio, Mt. Gilead	.....11 a.m., June 25	Grading two county roads	Co. Comrs.
Ohio, Cincinnati	.....Noon, June 26	Cleaning and oiling pike	County Commissioners
Utah, Ogden	.....10 a.m., June 30	Constructing asphalt pavement on concrete base	F. O. Stanford, City Recorder
SEWERAGE				
Ohio, Mt. Vernon	.....Noon, June 13	Sanitary sewer in various streets	W. H. White, Dir. Pub. Serv.
N. J., Morristown	.....8 p.m., June 15	Constructing 600 ft. of 8-in. sanitary sewer and about 480 ft. 5-in. service pipe	Sewer Com., Boro. of Madison
Mich., Bay City	.....9 a.m., June 15	Constructing 12-inch socket tile sewer	Board of Public Works
N. J., Perth Amboy	8.30 p.m., June 15	Constructing sewer in various streets	G. M. Adair, Street Comr.	
N. J., Bloomfield	.....8 p.m., June 15	Constructing vit. pipe and c. i. storm drain sewer	R. F. Davis, Town Clerk
N. J., Milltown	.....2 p.m., June 15	8 miles of 8 to 15-in. vit pipe sewer	Borough Council
N. Y., Oswego	.....2 p.m., June 16	Constructing 9,600 ft. of vit. tile, sanitary and combined sewers	C. W. Lindsley, Comr. Public Works
R. I., Newport	.....10 a.m., June 16	Supplying vit. pipe	Bur. Sup. & Accts., Navy Dept., Wash., D. C.
Ill., Berwyn	.....8 p.m., June 16	Constructing sewers, two jobs	Board of Local Imps.
Neb., Grand Island	.....8 p.m., June 17	Constructing one sewer	H. E. Clifford, City Clerk
Ind., Brennan	.....June 24	Sewer, consisting of 900 15-in., 2,050 ft. 12-in., 1,910 ft. 10-in. vit sewer tile, inlets, house connections, etc.	T. F. Noblock, Town Clerk
Pa., Lebanon	.....5 p.m., June 25	About 55,000 ft. of vit. pipe sewer, 6 to 18-inch	T. R. Crowell, City Engr.
Ia., Creston	.....About June 30	1,100 ft. 12-in., 2,890 ft. 10-in., 8,622 ft. 8-in. and 12,930 ft. 6-in. vit. pipe sewer	J. F. Golden, City Clerk
Mont., Choteau	.....6 p.m., July 6	Sanitary sewer and disposal plant (see proposal ad)	S. L. Powers, Town Clerk
WATER SUPPLY				
R. I., Newport	.....10 a.m., June 16	Supplying cast iron pipe	Bur. of Sup. & Accts., Navy Dept., Wash., D. C.
Tex., Fort Bliss	.....11 a.m., June 30	Extending water works system	W. E. Hunt, Depot Q. M., El Paso
Wash., Puget Sound	10 a.m., June 23	Supplying iron pipe and fittings	Bur. Sup. & Acct., Navy Dept., Wash., D. C.	
Cal., Mare Island	.....10 a.m., June 23	Furnishing iron pipe and fittings	Bur. Sup. & Accts., Navy Dept., Wash., D. C.
LIGHTING AND POWER				
Pa., Philadelphia	.....Nnoon, June 18	Furnishing electric lamps and lighting, maintaining, etc.	G. D. Porter, Dir. Pub. Safety
Kan., Powhattan	.....About June 30	Electric light transmission line and distributing system	L. C. Christenson, City Clerk
FIRE EQUIPMENT				
N. J., East Orange	.....June 16	Repairing several fire houses	L. A. Streit, Sec. Fire Comrs.
N. Y., Cohoes	.....June 18	Furnishing two tractors, one triple combination wagon and one chassis	Board Fire Commissioners
BRIDGES				
Mass., Gt. Barrington	2 p.m., June 15	Constructing reinforced concrete bridge	Selectmen	
Ind., Fort Wayne	.....10 a.m., June 16	Constructing reinforced concrete retaining wall	Board of Commissioners
MISCELLANEOUS				
Ill., Chicago	.....11 a.m., June 25	Constructing section 2 of Wilson Ave. tunnel	L. E. McGuire, Comr. P. S.

STREETS AND ROADS

Redwood City, Cal.—Board of Supervisors has sold \$125,000 worth of State highway bonds, which it bought at par two weeks ago for \$119,175.

Wilmington, Del.—Bids will be received by B. A. Groves, Chr. Finance Committee, until 12 o'clock noon, June 23, 1914, at office of Levy Court in Court House in City of Wilmington, Del., for purchase of all or any part of \$100,000 4½% coupon highway improvement, 4th series, or any part of \$200,000 4½% coupon building commission gold bonds of New Castle County, Delaware.

Sterling, Ill.—City Council has passed ordinance 346, recommended by Board of Local Improvements, providing for paving of Sixth Ave. Estimated cost of improvement is \$4,367.40.

Bedford, Ind.—\$22,100 worth of Lawrence County (Shawswick Township) gravel road bonds have been sold by County Treasurer Earl G. Short, at premium of \$171.50, with accrued interest. The Citizens' National Bank of Bedford was purchaser.

Atchison, Kan.—Commercial St., between Ninth and Thirteenth, will be covered with 3 ins. of crushed stone bound with tarva dressing and provided with combination curb and gutter. S. E. Wilcox, of Alpine Construction Co., of Kan-

sas City, was awarded contract by Council. His bid for work between Ninth and Eleventh Sts., totaled \$6,159.25, and between Eleventh and Thirteenth Sts., \$5,644.50.

Leavenworth, Kan.—Estimates have been presented by City Engineer Franks and accepted for paving Seventh St., between Shawnee and Miami Sts. By using rock on street engineer estimates that paving can be done for \$1.57 a yd., while without using rock he estimates it can be done for \$1.62 a yd.

Augusta, Me.—State Highway Commission has opened following bids for highway construction: Waldoboro section. No. 1—R. G. Miller, Hartford, Conn., \$23,057.96; A. D. Bridge's Sons, Hazardville, Conn., \$21,960.91. Waldoboro section. No. 2—R. G. Miller, Hartford, Conn., \$22,879.65; A. D. Bridge's Sons, Hazardville, Conn., \$25,564.60; Ahern Construction Co., Willimantic, Conn., \$22,748.85. Trenton section. No. 1—A. Williams & Co., Boston, \$10,546.70; J. H. Stalford, Bar Harbor, \$19,731.20; Small & Ingalls, Bar Harbor, \$18,985.75; M. C. Morrison and L. B. Georgione, Bar Harbor, \$15,264.27. Trenton section. No. 2—A. Williams & Co., Boston, \$13,294.63; alternate bid \$16,820.43; J. H. Stalford, Bar Harbor, \$23,513.14; alternate bid \$21,522.10; Small & Ingalls, Bar Harbor, \$21,853.75; alternate bid \$21,321.55. Trenton section. No. 3—

A. Williams & Co., Boston, \$10,505.97; J. H. Stalford, Bar Harbor, \$16,182.46; Small & Ingalls, Bar Harbor, informal, \$14,862.20. Monmouth section—R. G. Miller Co., Hartford, Conn., \$28,684.40; A. D. Bridge's Sons, Hazardville, Conn., \$45,260.70; Forgione & Romano, South Portland, \$38,627.50. Green section—R. G. Miller, Hartford, Conn., \$10,902.93; A. D. Bridge's Sons, Hazardville, Conn., \$12,652.92; Forgione & Romano, South Portland, \$14,585.80. Leeds section—R. G. Miller Co., Hartford, Conn., \$11,672.90; Forgione & Romano, South Portland, \$13,369.40.

Cumberland, Md.—Ordinance, calling for special election in city, to be held July 1, to vote on issue of \$150,000 bonds for street paving, has been passed by City Council.

Haverhill, Mass.—Municipal Council has decided that \$40,295 could be expended on street repairs. Schedule of streets, which included work amounting to more than \$100,000, was carefully considered and following thoroughfares selected as streets on which work would be done: Washington St., Washington Sq., and Bridge St., \$4,200; Mill St., \$4,500; Washington St., from Beach St. to end of car line, gravel road, \$3,700; Boardman St., \$2,000; Broadway, \$3,400; Dudley St., \$2,040; Johnson St., \$1,270; Lakeview Ave., gravel, \$2,675; Lawrence

St., \$4,000; Prospect St., Bradford district, \$2,750; Sheridan St., \$3,800; Westland terrace, \$2,560; Newcomb St., \$3,400.

Floodwood, Minn.—Commissioner Kapuppi has stated that Floodwood district would receive aggregate of \$13,000 this year to be spent in construction of new roads. Among roads to receive share are: Floodwood River Rd., \$2,000; Wuotila Rd., \$800; Lauri Rd., \$800; Simonson Rd., \$400; Lake Rd., contract let, \$1,600.

Walden, N. Y.—Trustees have decided to order another consignment of road oil, sufficient to cover 40,000 sq. yds. of the village streets, at cost of about \$600.

Hamilton, O.—Many petitions for oiling of streets are being circulated by property owners, and will be presented to service director for action. Any street will be oiled by city upon receipt of petition signed by 51 per cent. of property owners.

Salem, O.—Improvement of McKinley Ave. by repaving with vitrified blocks, according to city engineer's report submitted to Council, would cost \$28,140. This report of engineer was accepted, and Council proceeded to pass ordinance declaring it necessary to proceed with improvement of McKinley Ave., from Main St. east to corporation line.

Harrisburg, Pa.—Bids from eight contracting concerns for as many different kinds of paving material have been opened by Council. Bids were on work of paving, curb and catch basins for 17 sections of borough highway work on which is expected to be finished by fall. Bids for surfacing ranged from \$1.55 for concrete to \$3.19 for granite block. Lowest bid for plain concrete curb was 40 cts. Steel-bound concrete curb was not listed in specifications. Low bid for catch basins was \$36. Low bids per sq. yd. on the various kinds of material were as follows: Concrete, \$1.55; Warrenite, \$2.12; sheet asphalt, \$2; brick, \$2.35; amebsite, \$1.90; wood block, \$2.75; Harremite, \$1.65; granite block, \$3.19. Bids on plain concrete curb ranged from 40 cts. to 92 cts. a foot. Bidders were Central Construction & Supply Co., W. R. Benson, E. W. Ensign, Charles T. Eastburn Co., W. O. Thompson, J. B. Trexler, Standard Bitulithic Co., and S. W. Shoemaker.

Hazleton, Pa.—Preparations are now under way for oiling of North Church St. above Diamond Ave.

Pottsville, Pa.—City Council has passed on second and final reading ordinances authorizing paving with brick of West Market St., from Fourth to Twelfth St.

Charleston, S. C.—Comprehensive outline of improvements for streets of city has been decided on by committee on streets, of which Alderman John F. Rafferty is chairman. Five streets will be paved with wood block; seventeen streets with sheet asphalt, one with shell and concrete sidewalks will be laid on about 29 streets.

Denison, Tex.—Citizens voted on June 4 bonds in sum of \$25,000 for permanent street improvements. A. B. Clenny is City Engineer.

Niagara Falls, Ont.—Boulevard to Bridgeburg is to be completed through to Fort Erie this year. Park Commission is to pay 65 per cent. of cost of extending boulevard, rest to be paid by villages of Bridgeburg and Fort Erie. These municipalities will jointly pay one-half of cost of maintaining roads. Estimated cost of extending boulevard is \$20,000.

CONTRACTS AWARDED.

Sterling, Ill.—Martin Bros. and Board of Local Improvements have let contract to Warren P. Burdick for 1,196 ft. of combined curb and gutter.

Kokomo, Ind.—County Commissioners have let contracts for five new roads in Center Township under three mile gravel road law. Four of contracts, amounting to \$128,050 were let to Kokomo Asphalt Paving Co. Four roads are Butcher Rd., McClure Rd., Ruse Rd., and Harmoll Rd. All are to be built of asphaltic concrete. The Drinkwater Rd. was let to J. H. Watson & Son, contract price \$19,000. Western Construction Co., Lafayette, Ind., and J. H. Watson & Son were competitive bidders on four roads awarded to Kokomo Asphalt Paving Co., but paving company was lower by \$10,000 on four jobs. All of roads are in Center Township.

Kokomo, Ind.—The Kokomo Asphalt Paving Co., of which Walter J. Dixon is principal stockholder, is low bidder on contract for about 1½ miles of street. Bids were advertised for improvement of High St., from Third St. to 24th St. Dixon put in bid for sheet asphalt. Bid of local man was \$86,000, or about \$1.73 a sq. yd.

Muncie, Ind.—Frank Hines was given contract for construction of Weaver Rd. in Center Township, price being \$7,423. It will be of tarvia construction. The Dorton Rd. in Union Township will be constructed by Hines also, price being \$11,445.

New Castle, Ind.—To James Garvey, local contractor, contract for improvement of South Main St. He bid \$2 a sq. yd. on Trinidad asphalt and award was made on this material.

Vincennes, Ind.—W. H. Moore & Son have been given contract for building cement sidewalks on North First St., from Busserson to Eberwine Ave. Price at which contractor accepted work was \$11,906.50. The Foulks Construction Co., of Terre Haute, bid for the work, their figure being \$13,056.80. Charles Hamke & Son, of this city, bid \$13,232.50. Contract is one of largest of its kind that has been let here in several years, it calling for 5,150 sq. yds. of concrete pavement, 9,050 yds. of limestone curb and 300 sq. yds. of round corners.

Council Bluffs, Ia.—By City Council for paving of North Broadway and South Ave. with concrete to E. A. Wickham.

Two Harbors, Minn.—Bids for grading and grubbing of State Rd. No. 1 have been opened and contract for work was let to Jacob Rafn, lowest bidder. This piece of state road is last connecting link between state road running north from this city and road in Cook County, which connects with Port Arthur, Ont. Road is seven miles in length, and will cost county approximately \$7,000.

BIDS RECEIVED.

York, Pa.—Following are respective bids per square yard for paving of Belvidere Ave.: General Supply & Construction Co., brick, Pennsylvania clay, \$2.37; Mack, \$2.43; Toronto, \$2.45; Fairmount, \$2.40; wood block, \$2.69; all other streets the same bid. G. W. Ensign, Inc., Harrisburg, wood block, \$2.69; all other streets the same bid. Field, Barker & Underwood, Philadelphia, conditional upon receiving contract for 20,000 sq. yds., brick, Mack, \$2.70; Bessemer, \$2.72; wood block, \$2.92. West College Ave., between George and Codorus Creek, brick, Mack, \$2.71; Messemer, \$2.73; wood block, \$2.93. East Cottage Pl., between George and Queen, brick, Mack, \$2.71; Bessemer, \$2.73; wood block, \$2.93. South Duke, between King and College Ave., brick, Mack, \$2.71; Bessemer, \$2.73; wood block, \$2.93. North Hawthorne, between Linden Ave. and Madison, brick, Mack, \$2.70; Bessemer, \$2.73; wood block, \$2.92. East King, between South Duke and Pine, brick, Mack, \$2.70; Bessemer, \$2.72; wood block, \$2.92. West King St., between George and Water, brick, Mack, \$2.71; Bessemer, \$2.73; wood block, \$2.93. East Market, between Lehman and Harrison, brick, Mack, \$2.74; Bessemer, \$2.76; wood block, \$2.96. East Mason alley, between Court alley and Duke, brick, Mack, \$2.72; Bessemer, \$2.74; wood block, \$2.94. West Philadelphia, between Newberry and Codorus Creek, brick, Mack, \$2.71; Bessemer, \$2.74; wood block, \$2.92. South Pine, between Market and King, brick, Mack, \$2.78; Bessemer, \$2.80; wood block, \$2.99. South Pine, between King and College Ave., brick, Mack, \$2.75; Bessemer, \$2.77; wood block, \$2.97. East Princess, between George and Queen, brick, Mack, \$2.70; Bessemer, \$2.72; wood block, \$2.92. West Princess, between George and Water, brick, Mack, \$2.70; Bessemer, \$2.72; wood block, \$2.92. South Queen, between Market and Cottage Pl., brick, Mack, \$2.70; Bessemer, \$2.72; wood block, \$2.92. Royal, between Market and King, brick, Mack, \$2.69; Bessemer, \$2.70; wood block, \$2.91. North West, between Linden and Madison, brick, Mack, \$2.70; Bessemer, \$2.72; wood block, \$2.92. W. R. Benson, Philadelphia, brick, Mack, \$2.59; Porter, \$2.59; wood block, \$3.12. All other streets the same bid. Central Construction & Supply Co., Harrisburg, 20,000 sq. ft. to be the minimum award, asphalt, \$1.95. The same paving as on East Market St., from the M. & P. Railroad to the city limits. Newton Paving Co., Trenton, N. J., brick, Pennsylvania clay, \$2.59; asphalt, Star brand, \$1.93. The same bids for West College, between George and Codorus Creek; East College, between George and Queen; South Duke, between King and College Ave.; North Hawthorne, between Linden and Madison; West King, between George and Water; East Market, between Lehman and Harrison; West Philadelphia, between Newberry and Codorus Creek; South Pine, between Market and King; South Pine, between King and College; East Princess, between George and Queen; West Princess, between George and Water; South Queen, between Market and Cottage Place; Roy-

al, between Market and King; North West, between Linden and Madison; East King, between South Duke and Pine, brick, Pennsylvania clay, \$2.58; asphalt, \$1.93. East Mason alley, brick, Pennsylvania clay, \$2.65; asphalt, \$2. B. H. Coryell, Williamsport, submitted no bid on Belvidere Ave. West College, between George and Codorus Creek, brick, Pennsylvania clay, \$2.66; American, \$2.67; Bessemer, \$2.70; wood block, \$2.83. Cottage Place, between George and Queen, brick, Pennsylvania clay, \$2.61; American, \$2.62; Bessemer, \$2.65; wood block, \$2.78. Duke, between King and College, brick, Pennsylvania clay, \$2.61; American, \$2.62; Bessemer, \$2.65. East King, between Duke and Pine, brick, Pennsylvania clay, \$2.61; American, \$2.62; Bessemer, \$2.65; wood block, \$2.68. West King, between George and Water, brick, Pennsylvania clay, \$2.58; American, \$2.59; Bessemer, \$2.62; wood block, \$2.75. East Mason, between Court alley and Duke, brick, Pennsylvania clay, \$2.66; American, \$2.67; Bessemer, \$2.70; wood block, \$2.83. West Philadelphia, between Newberry and Codorus Creek, brick, Pennsylvania clay, \$2.66; American, \$2.67; Bessemer, \$2.70; wood block, \$2.83. East Princess, between George and Queen, brick, Pennsylvania clay, \$2.61; American, \$2.62; Bessemer, \$2.65; wood block, \$2.65. West King, between George and Water, brick, Pennsylvania clay, \$2.61; American, \$2.62; Bessemer, \$2.65; wood block, \$2.78. South Queen, between Market and Cottage Place, brick, Pennsylvania clay, \$2.58; American, \$2.59; Bessemer, \$2.62; wood block, \$2.75. Royal, between Market and King, brick, Pennsylvania clay, \$2.64; American, \$2.62; Bessemer, \$2.65; wood block, \$2.78. No bids for Hawthorne, Market, South Pine and West Sts. Standard Bitulithic Co., New York City, bitulithic, \$2.25. The same bid all other streets. The running of contract to be 30,000 sq. yds. Charles E. Eastburn Co., Yardley, bid only on South Queen St., between Market and Cottage Place, brick, Porter repressed, \$2.60; Porter wire cut, \$2.55; Mack, \$2.75; Pennsylvania clay, \$2.75; Warrenite, \$2.58. A. B. Kraft bid on following streets: West College, between George and Codorus Creek, brick, Mack, \$2.26; Pennsylvania clay, \$2.25; Patterson, \$2.25; others except Metropolitan, \$2.25; United States Preserving Co. blocks, \$2.50; Southern wood blocks, \$2.45. East Cottage Pl., between George and Queen, brick, Pennsylvania clay, \$2.35; United States Wood Preserving Co. blocks, \$2.60; Southern wood blocks, \$2.60. South Duke, between King and College Ave., brick, Pennsylvania clay, \$2.32; Mack, \$2.31; Bessemer, \$2.38; Patterson, etc., except Metropolitan, \$2.32; United States Wood Preserving Co. blocks, \$2.57; Southern wood blocks, \$2.49. East King, between Duke and Pine, brick, Pennsylvania clay, \$2.32; Mack, \$2.31; Bessemer, \$2.38; Patterson, etc., except Metropolitan, \$2.32; United States Wood Preserving Co. blocks, \$2.57; Southern wood blocks, \$2.49. East Mason alley, between Court and Duke, brick, Pennsylvania clay, \$2.32; Mack, \$2.31; Bessemer, \$2.38; Patterson, \$2.32; United States Wood Preserving blocks, \$2.57; Southern wood blocks, \$2.49. East Princess St., between George and Queen, brick, Pennsylvania clay, \$2.32; Mack, \$2.31; Bessemer, \$2.38; Patterson, etc., except Metropolitan, \$2.32; United States Wood Preserving Co. blocks, \$2.57; Southern wood blocks, \$2.49. West Princess, between George and Water, brick, Pennsylvania clay, \$2.36; Mack, \$2.31; American, \$2.35; Toronto, \$2.35; Bessemer, \$2.32; United States Wood Preserving blocks, \$2.57. South Queen St., between Market and Cottage Place, brick, Pennsylvania clay, etc., except Metropolitan, \$2.34; United States Wood Preserving blocks, \$2.57; Southern wood blocks, \$2.49. Union Paving Co., Schenectady, N. Y., Asphalt, \$2.37, in case of not less than 25,000 sq. yds. Brick, Bessemer, \$2.89; Patterson, \$2.89; wood blocks, \$3.48. Same bid all other streets. Eastern Paving Co., Philadelphia, Asphalt, \$1.89; Topeka bitumen, \$1.65; Roctec, \$1.64. West College, between George and Codorus Creek, asphalt, \$1.38; Topeka bitumen, \$1.59; Roctec, \$1.58. East Cottage Place, between George and Queen, asphalt, \$1.84; Topeka bitumen, \$1.63; Roctec, \$1.62. South Duke, between King and College, asphalt, \$1.88; Topeka bitumen, \$1.64; Roctec, \$1.63. North Hawthorne, between Linden Ave. and Madison, Asphalt, \$1.89; Topeka bitumen,